

THE MINERAL INDUSTRIES OF CENTRAL EUROPE

THE CZECH REPUBLIC, HUNGARY, POLAND, AND SLOVAKIA

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The Central European transitional economy countries of the Czech Republic, Hungary, Poland, and Slovakia represent one of the more economically dynamic regions of the former centrally planned economy countries of Europe and Central Eurasia. As founding members of the Central European Free Trade Agreement (Bulgaria, Romania, and Slovenia joined in 1999), these countries have continued to implement policies designed to harmonize standards and trade with a view to integrate themselves fully into the European Union (EU) as they had done in the European security sphere through membership in the North Atlantic Treaty Organization. To accommodate new standards, the development of new commercial infrastructure in the region has warranted continued focus on the region's cement, industrial minerals, and steel industries. The trend of large-scale foreign investment in the cement and associated quarrying industries in the Central European region, which emerged during the 1990s, also became more clearly discernible in the region's iron and steel sectors during 2001 and 2002.

CZECH REPUBLIC

The Czech Republic was an important Central European producer of heavy industrial goods manufactured by the country's chemical industries, machine building, and toolmaking. Steelmaking, the mining and processing of industrial minerals, and the production of construction materials continued to be of regional and domestic importance.

In 2002, the Czech Republic's gross domestic product (GDP), which is based on purchasing power parity, increased by 2.0% compared with that of 2001 (International Monetary Fund, 2003). Industrial production increased by about 5%. According to data provided by Geofond (2003, p. 190), which was the country's leading mineral information agency, the mining and processing sector's share of the GDP declined to 1.2% in 2002 from 3.7% in 1993; this was largely the result of economic transition to a market-based economy from central economic planning. In 2002, the privatization of the iron and steel sector continued to be a dominant issue in the country's minerals industry.

Government Policies and Programs

The Government continued policies of economic development whose purpose has been to integrate the country into the EU. The country's membership in the International Monetary Fund, the Organization for Economic Cooperation and Development (OECD), the World Bank for Reconstruction and Development, and the World Trade Organization and participation in the General Agreement on Tariffs and Trade was largely an outcome of the Czech Republic's full orientation to a Western European political system and market economy.

Three constituent acts comprise the country's mining law, which forms the foundation of the Government's mining and other mineral-related policies—Act No. 44/1988 Coll., on Protection and Use of Mineral Resources (the Mining Act), as amended; the Czech National Council Act no. 61/1988 Coll., on Mining Activity, Explosives, and State Mining Administration (Authority/Sedenka), as amended; and the Czech National Council Act No. 62/1988 Coll., on Geological Works, as amended. The Mining Act classifies minerals into either "reserved" or "unreserved" categories. The reserved category refers to mineral deposits that, apart from immediate market considerations, were determined to be necessary for the development of the national economy (Luks, 1997; Geofond, 2003, p. 18-19). Other provisions in the mining law address issues of licensing and Federal and regional compliance with environmental regulations during the exploration and exploitation of a mineral deposit and the reclamation of mined-out areas.

To meet the needs of a developing market economy, major changes in the Czech Republic's environmental policies were enacted in 1997. On the basis of environmental principles that were approved by the Government in 1995, the new policy was officially formulated in the Environmental Law of 1997, Act No. 125/1997. Also, four of the six enabling provisions of the new law were formally adopted at the same time as the new law on January 1, 1998. The Environmental Law focused on reducing the volume of waste, discreet collection of waste by category, and recycling. The Law adopted the main provision in the environmental regulations of the EU and the OECD and those of the Basle Convention. The catalog of wastes is compatible with the European Catalogue of Wastes of the EU.

Production and Trade

In 2002, the iron and steel industry, which constituted the major part of the country's metallurgical sector, continued to increase the output of pig iron (3.5%) and crude steel (3.1%). The production of hot-rolled steel semimanufactures increased by about 4.3% compared with that of 2001 (International Iron and Steel Institute, 2004, p. 3, 51).

Since mine output of iron ore ceased in 1992, the Czech Republic has depended entirely on imports for its iron ore requirements. Trade data for 2002 indicated that total iron ore imports by the Czech Republic amounted to about 6.8 million metric tons (Mt), or slightly less than the total import in 2001, and that the Czech Republic depended mostly on Ukraine (about 72%) and Russia (about 26%) for imports of iron ore and concentrate. Net imports of pig iron amounted to about 62,000 metric tons (t) (Geofond, 2003, p. 24).

In 2002, the production of mineral fuels registered mixed results. The production of natural gas and coal (brown and lignite) declined by about 10% and 4%, respectively, compared with output levels attained in 2001. The production of petroleum, however, increased by about 42%. Bituminous coal production was about 5% less than that produced in 2001. Although the Czech Republic remained a net exporter of all forms of coal, the country continued to rely on imports of natural gas and petroleum to meet almost all its requirements (Geofond, 2003, p. 77, 81).

Major changes in the industrial minerals sector were increases in the production of feldspar, fusible basalt, and gypsum and downturns in the production of bentonite, diatomite, kaolin, and silica sand (table 1).

Commodity Review

Metals

The Czech Republic's metals sector produced a broad range of base metals and semimanufactures from imported primary raw materials (ores and concentrates) and secondary materials (scrap). Although gold mining in some parts of the Czech Republic remained prospective owing to local environmental concerns, economic resources of most metals have been depleted. According to Geofond (2003, p. 21), most of the country's metallic mineral deposits as of December 31, 2000, were not economic. Gold-bearing and tin-tungsten ores were among the exceptions.

Aluminum.—With sources of aluminum limited to imports, the Czech Republic's aluminum industry chiefly processed secondary aluminum and fabricated semimanufactures and finished aluminum commodities. In 2002, the Czech Republic's imports of unwrought aluminum, alumina, and bauxite amounted to 141,482 t, 22,117 t, and 15,398 t, respectively. The Czech Republic's main export of unfabricated aluminum consisted of 34,604 t of unwrought aluminum (primary shapes) (Geofond, 2003, p. 77, 81).

In 2002, Kovohute Mnisek AS, which was the country's largest producer of secondary aluminum and primary aluminum alloys, reported production problems that stemmed from a significant decline in the availability of aluminum scrap. Despite expected market improvements at yearend, the company expected financial losses in 2002 (Metal Bulletin, 2002d, e).

In 2002, Somitomo Light Metal Industries Ltd. announced plans to invest about \$13 million in the construction of an aluminum tube extrusion plant near Prague. Aluminum tube production from the proposed facility was to be earmarked for use mainly in the automotive sector (Metal Bulletin, 2002i).

Copper.—The Czech Republic relied almost exclusively on imports of refined copper, copper alloys, and scrap to meet its industrial needs. Following an increase of refined copper imports of almost 30% in 2001 compared with those of 2000, imports of refined copper and copper alloys declined by about 35% to 11,939 t in 2002. Poland, Germany, and Serbia and Montenegro supplied about 41%, 37%, and 6%, respectively, of total imports.

The Czech Republic remained a substantial net exporter of copper scrap. In 2002, copper scrap exports, which exceeded copper scrap imports by about 23 times, amounted to 38,167 t (Geofond, 2003, p. 32, 33).

In 2002, Kovohute Calakovice AS, which was the country's major processor of copper scrap, announced intentions to maintain its 4-year investment plan despite an economic performance in 2001 that was below the company's expectation. The investment plan included the addition of two new furnaces and the modernization of the plant's three presses. The company's management expected the investment program to raise efficiency that would not only increase profits, but also raise domestic market share to 80% from 75%. The company produced copper rod, pipe, and wire (Metal Bulletin 2001b, 2002b).

Iron and Steel.—As of December 31, 2002, two deposits of magnetite were on the official registry. The magnetite deposits were located at Kovarska in the northeastern part of the country and at Zupanice in the south. These deposits contained about 21 Mt of uneconomic resources (Geofond, 2003, p. 22, 23).

All the raw materials consumed by the country's steel industry—iron ore and concentrate and pellets and agglomerate—were imported. In 2002, more than 6.8 Mt of iron ore and concentrate was imported mainly from Ukraine and the Russian Federation, which accounted for about 72% and 26%, respectively, of the total imports. Net imports of pig iron amounted to about 62,000 t. Russia, Slovakia, and Ukraine accounted for 74% of the 91,000 t of pig iron imported by the Czech Republic; net exports of iron and steel scrap amounted to about 685,000 t (Geofond, 2003, p. 24).

Manganese, which is of prime importance to the steel industry, was obtained entirely from imports of ores and concentrates. In 2002, the Czech Republic imported 11,507 t of manganese ores and concentrates; Ukraine, the Netherlands, and South Africa supplied about 47%, 23%, and 21%, respectively. Imports of ferromanganese amounted to 21,055 t, of which Slovakia supplied about 40%; those of ferrosilicomanganese totaled 26,139 t, of which Ukraine supplied about 50% (Geofond, 2003, p. 27, 28).

The steel industry operated eight steel plants with a collective capacity to produce almost 11 million metric tons per year of steel. The main steel producers were Nova Hut s.p. Ostrava (NH), Zelezarne Vitkovice (ZV), Trinecke Zelezarny, and Poldi United Steel Works and accounted for more than 95% of total crude steel production capacity.

The rationalization of the iron and steel industry and the increasing foreign investor interest in Czech ferrous metallurgy continued in 2002. Following prolonged negotiations during the year, LNM Holdings Ltd. of the United Kingdom acquired NH in June. The total value of the transaction was about \$811 million, of which about \$471 million was to be earmarked for covering NH's debts and liabilities and about \$340 million, for capital investment and working capital (Metal Bulletin, 2002f; World Steel & Metal News, 2002).

In 2002, ZV was sold to Osinek, which was a branch of the Czech Republic's National Property Fund (NPF). The NPF obtained about 99% of ZV stock in a transaction valued at about \$90 million. The new owner indicated plans to sell a restructured ZV within a year (Metal Bulletin, 2002c, h). With the sale of its steel-producing branch, Vitkovice, ZV's parent company, would continue to operate as an engineering firm.

Lead and Zinc.—Lead and zinc have not been mined in the Czech Republic for about 7 years. The number of registered lead deposits declined to 9 in 2002 from 17 in 1998. Similarly, the number of registered zinc deposits declined to 10 from 18 in 1998. Nine of the ten registered deposits contained both metals, the ore minerals being galena and sphalerite. None of the deposits, however, were being worked during this period (Geofond, 2003, p. 36, 40).

In 2002, about 57,000 t of primary lead was imported. Germany, Sweden, and Poland, which were the main suppliers of primary lead to the Czech Republic, accounted for about 76%, 9%, and 8%, respectively (Geofond, 2003, p. 37). All the Czech Republic's net exports of lead scrap, which amounted to 3,162 t, was shipped to Germany (Geofond, 2003, p. 37). The chief source of domestic secondary lead raw materials was recycled batteries collected and processed by Kovohute Pribram, which was the Czech Republic's sole recycler of secondary lead.

According to a company spokesperson, in addition to secondary lead processing, Pribram's purchases of scrap that contain precious metals will increase, and the company's recycling (gold, palladium, platinum, and silver) was intended to raise company profits (Metal Bulletin, 2001a). In 2002, Pribram's facility expansion to process additional precious-metals-bearing scrap was completed. The new facilities included a laboratory and a shredder. During the year, only 50% of the new capacity was used owing to shortages of scrap (Metal Bulletin, 2002a).

About 51% of the Czech Republic's imports of crude unwrought zinc in 2002 was supplied by Poland. Germany and Belgium accounted for about 19% and 6%, respectively, of total imports. Czech exports of zinc waste and scrap amounted to more than 2,300 t; Germany was the major recipient (Geofond, 2003, p. 41).

Magnesium.—In 2002, Magnesium Elektron (a subsidiary of Luxfer Group of the United Kingdom) began a second commissioning phase of the new 10,000-metric-ton-per-year magnesium alloy plant in northern Bohemia. The plant's feedstock consisted of magnesium recycled from the die-casting industry's scrap (Metal Bulletin, 2002g).

Industrial Minerals

The Czech Republic was well-endowed with and produced a broad range of industrial minerals that were sufficient for exports and most domestic construction and chemical industry requirements. The availability of these minerals at the recent average rate of mining ranged from about 43 years for gem-grade pyrope ore to more than 3,000 years for silica raw materials. Such corrective additives as clays, loams, loess, shales, and sands needed by the country's cement industry to regulate the content of aluminum (Al_2O_3), iron (Fe_2O_3), and silicon oxide (SiO_2) during clinker production were reported collectively to have a mining life of about 1,380 years. Limestone, kaolin, and glass sand (descending order of resource amounts) were among those industrial minerals that had the largest resources suitable for exploitation (Geofond, 2003, p. 85, 86).

During the late 1990s, foreign investment in the Czech Republic's minerals industry focused primarily on the acquisition of cement plants and their associated raw materials quarries

Mineral Fuels

The energy policy of the Czech Republic promoted the following aims: the decontrol of prices for energy; the denationalization, rationalization, and restructuring of the energy industry sector; an increase in the level of conservation, health and safety, and pollution control in the energy sector; the diversification of electricity, natural gas, and petroleum supply; and the raising of the efficiency of domestic production of fossil fuels. To help make its governmental and economic structures more compatible with those of the EU, the Government will proceed with harmonizing the country's energy sector's standards with those of the EU.

Coal.—Bituminous, or hard, coal occurs mainly in the Upper Silesian Basin. Of the resources in this region, only about 15% is in the Czech Republic; the balance of the resources is in Poland. Bituminous coal (“phytokaustobiolite” as it is described in the Czech Republic’s annual Mineral Commodity Summaries of the Czech Republic) has a higher degree of coalification than lower rank coals. Some of the characteristics of Czech bituminous coal include a carbon content of more than 73.4%, volatile matter of less than 50%, and a dry ash-free calorific value that exceeds 24 megajoules per kilogram. As of December 31, 2002, the Czech Republic reported that the total resource of bituminous amounted to more than 16 billion metric tons (Gt). Coal output in 2002 remained steady at just more than 14 Mt. Imports, which amounted to 1.217 Mt, were derived almost exclusively from Poland (97.9%). About 5.7 Mt of bituminous coal was exported mainly to Austria, Germany, and Slovakia (Geofond, 2003, p. 65-66).

In addition to bituminous coal, the Czech Republic distinguishes two types of lower rank coal—brown coal and lignite. Brown coal has a lower level of coalification; that is, with a fixed level of carbon of less than 73.5%, volatile matter of more than 50%, and a dry (ash-free) calorific value of less than 24 megajoules per kilogram. The vitrinite reflective boundary between bituminous coal and brown coal is lower than 0.5% for brown coal. The boundary between brown coal and lignite, however, is not differentiated owing to the inclusion of high-volatile lignite in the brown coal category (Geofond, 2003, p. 69). The Czech Republic’s brown coal deposits are worked in the northwestern part of the country in the Bohemian brown coal basins. The major brown coal basins are found in the Krusne hory Mountains region and cover an area of 1,900 square kilometers. Coal also is mined in the Cheb, the Sokolov, and the Zitava Basins. As of December 31, 2002, total resources of brown coal amounted to more than 9.5 Gt. Brown coal was used mainly as a fuel in the country’s electric power industry; a minor proportion was consumed by the chemicals sector. In 2002, major foreign commerce in brown coal centered on exports of about 2 Mt; Germany (50.3%) and Slovakia (37.1%) were the major recipients (Geofond, 2003, p. 69, 71). According to Geofond (2003, p. 73), Czech standards for coal describe high-volatile lignite as a variety of brown coal that has undergone the least amount of coalification and still has xylitic characteristics (fragments of wood, preserved tree trunks, etc.). Its dry calorific value is less than 17 megajoules per kilogram. The boundary between brown coal and high-volatile lignite is not distinct. Lignite is consumed mainly by the electric-power-generating sector; it also is used for heating. The chief deposits, which extend from Austria to Moravia, occur in the Vienna Basin. Total resources of lignite in the Czech Republic at the end of 2002 amounted to more than 1 Gt (Geofond, 2003, p. 74).

Natural Gas and Petroleum.—According to Geofond (2003, p. 76), the Czech Republic’s oil and gas-bearing/producing area is in the so-called Vienna-Moravia oil-bearing province. The deposits in this province are hosted in a large number of “individual oil-bearing structures and producing horizons . . .” to a depth of 2,800 meters. Sandstones of middle and upper Badenian age are described as hosting the most productive oil deposits. Hrusky was the largest deposit, but most of the oil at Hrusky had been extracted, and the structure serves mainly as an underground gas storage facility. Another oil-bearing area is in the Moravian region of the Carpathian foredeep where exploration was being conducted. Petroleum in this region occurs in weathered crystalline Paleozoic rocks. The prevailing type of petroleum is a light, sulfur-free, paraffin to paraffin-naphthene oil. As of December 31, 2002, the Czech Republic’s petroleum resources were about 32 Mt, of which about 13 Mt was categorized as economic proven; 8.2 Mt, as economic probable; and about 11.4 Mt, as subeconomic.

In 2002, the Czech Republic imported about 6 Mt of petroleum, of which about 4 Mt was imported from the Russian Federation and 943,000 t, from Azerbaijan. Total imports of petroleum from the Commonwealth of Independent States accounted for 84% of the country’s import needs. Exports during the same period were about 142,000 t (Geofond, 2003, p. 76, 77). In 2002, domestic production of crude oil as a percentage net imports amounted to about 4.3%.

Natural gas production declined by about 10% from 101 million cubic meters produced in 2001. In 2002, the Russian Federation supplied the Czech Republic with about 74% of the more than 6.9 billion cubic meters of natural gas imports; about 26% was obtained from Norway (Geofond, 2003, p. 82).

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HUNGARY

Bauxite was the only major nonfuel mineral produced in Hungary that was significant in terms of European mineral production. In 2002, Hungary maintained production of modest amounts of fossil fuels, industrial minerals, and metals. Despite substantial production of bauxite and alumina, Hungary's production of primary aluminum remained modest owing to limited domestic sources of energy. The production of coal, natural gas, and petroleum was sufficient to satisfy only about one-half of the country's annual energy needs.

In 2002, Hungary's gross domestic product increased by about 4.5% compared with that of 2001 (International Monetary Fund, 2004). The gross output (value) of industry rose by about 3.3%. The value of output of the mining and quarrying sector, however, declined by about 10%. Compared with total investment in 2001, which declined by about 42%, the level of investments in the mining and quarrying sector in 2002 rose by almost 46% (Hungarian Central Statistical Office, 2003, p. 420, 324).

Government Policies and Programs

The Government based its regulatory policies for mining and geologic survey work on provisions in the Mining Law of 1993 (Act XLVIII). Section 50 of the Mining Law was the basis for Governmental Decree No. 132/1993, which constituted the legislative basis for the Hungarian Geological Survey. The Mining Law and related decrees and codes established the legislative bases for estimating reserves, determining environmental risks associated with mining, and providing the geologic and technical information needed to outline tender conditions.

Government agencies that were responsible for enforcing existing environmental protection laws and regulations included the Ministry of the Environment and Regional Planning (KTM) and the Hungarian Mining Office (MBH). The KTM was authorized to help only in the enforcement of existing environmental legislation prescribed by other ministries of the Government. With respect to mining and minerals, Hungary's Ministry of Industry and Commerce had the primary responsibility for establishing environmental regulatory standards. The chief responsibility of the MBH was that of a certifying agency, which could review only technical developmental and operational plans. These plans were required to include provisions that pertain to environmental protection and land restoration by responsible entities.

Production and Trade

The output of bauxite declined by about 28% compared with that of 2001. The production of crude steel increased by about 4%. Among industrial minerals, the production of cement showed gains of about 1.7%. Total coal output fell by about 12%; the reduction of brown coal production amounted to about 25% compared with that of 2001; lignite production fell by about 6% (table 4).

Hungary's output of fossil fuels and industrial minerals was modest. To meet the needs of its economy, the country relied heavily on imported mineral raw materials. In 2002, the imports of crude raw materials, by volume, which included minerals, increased by about 3.7% compared with those of 2001; those of mineral fuels and electric power increased by about 7.4%. Exports of crude raw material rose by about 3% compared with those of 2001; exports of mineral fuels and electric power declined by almost 5%. The value of imports of metal ores and scrap rose by about 5.3% compared with those of 2001; exports of ore and scrap declined by almost 12%. Imports and exports of iron and steel declined by 2.7% and 1.3%, respectively. Trade in nonferrous metals registered declines in imports and exports of 5.5% and 4.5%, respectively (Hungarian Central Statistical Office, 2003, p. 334, 340).

Imports of industrial mineral products rose by 11.4% compared with those of 2001. Exports of industrial mineral products, however, declined by 3.5%. With respect to mineral fuels, the total value of imports was about five times greater than the value of exports; imports of natural and manufactured gas, coal and coal products, and petroleum and refinery products declined by 13.4%, 6.3%, and 5.7%, respectively. The value of natural gas exports rose by more than 18%. Coal and petroleum exports declined by 53.4% and about 5%, respectively, compared with those in 2001 (Hungarian Central Statistical Office, 2003, p. 341).

Commodity Review

Metals

Bauxite mining and refining of alumina and manganese mining (manganese carbonate and oxide ores mined at Urkut) remained the only metal mining and processing operations in Hungary.

Aluminum and Bauxite and Alumina.—Bakonyi Bauxitbánya Kft. (Bakonyi Bauxite Mines Ltd.) [a subsidiary of Magyar Aluminium Rt. (MAL)] mined the bauxite in the Bakonyi District; Hungary's total resources of bauxite were estimated to be about 23 million metric tons (Mt) with an average of 59% Al_2O_3 . Plans for the bauxite mining sector included the development of the Halimba II bauxite mine, which was to be put into operation in 2003 with a full production capacity of about 300,000 metric tons per year of bauxite. Three open pit bauxite mines also were planned for development (Molnar, 2003). Commercial reserves of bauxite amounted to 16 Mt at an average grade of 50.4% Al_2O_3 and 7% SiO_2 .

MAL, which was Hungary's alumina refining and aluminum smelting and fabricating firm, announced plans to bid for ownership of three bauxite mines in neighboring Bosnia and Herzegovina. MAL has been the sole customer at the three Bosnian mines. Should the

transaction succeed, MAL would consider raising output at the three mines to about 130,000 metric tons (t) from about 75,000 t produced in 2002 (Metal Bulletin, 2002b).

Copper.—Although Hungary no longer mined copper, past surveys of the deep-lying (900- to 1,100-meter) Recsk copper ore body in the Matra Mountains discovered about 175 Mt of copper ore at a grade of 1.12% copper, about 20 Mt of polymetallic ore at a grade of 4.22% lead and 0.92% zinc, and smaller quantities of gold, molybdenum, and silver. Geologic investigations conducted by the Government determined the area of mineralization to be about 10 square kilometers. After years of failed efforts to attract foreign investment, the exploration shaft and adit at the Recsk copper deposit, which was under care and maintenance, finally was closed, the equipment removed, and the facilities flooded in 1999 (Molnar, 2001).

Iron and Steel.—In 2002, the production of crude steel grew by about 4.1% compared with that of 2001. As in the other Central European countries, acquisitions and mergers in the steel sector were increasing, which reflected the Government's program to accommodate European Union (EU) standards and practices in preparation for Hungary's entry into the EU. All concentrates and ores needed for the country's three steel producers were imported.

In mid-2001, Italy's Cogne Acciai Speciali Srl, which was a producer of alloy (other than stainless), stainless, and tool steels, acquired Dam-Diósgyőr Acélművek Rt (DAM), which produced mainly carbon steel and nonstainless alloy, bearing, free-cutting, stainless, and tool steels. In 2002, apart from bringing DAM's product mix closer to that of its parent company and increasing foreign sales, its management invested about \$47 million for facility acquisitions and modernization. The company's product mix would be earmarked mainly for the automotive and tool and dye industries (MBM, 2002).

Rising rebar imports from Russia, Ukraine, and a number of Central European countries were among the chief issues of concern for OAM-Ozdi Acélművek Kft (Ozd) (a subsidiary of Max Aicher GmbH of Germany), which was a major Hungarian producer of carbon steel, rebar, and welded wire mesh. Increased domestic rebar demand stimulated imports of rebar, which Ozd management claimed undercut the prices of domestic material. Ozd management also ceased production of rebar for several months to avoid incurring losses while relatively cheap imports were becoming available. Sales were to continue, however, from a 25,000-t stockpile. Production resumed in June following Hungary's imposition of duties on finished steel from the Commonwealth of Independent States (25%) and the EU (15%) (Metal Bulletin, 2002c, e). Hungary's construction sector continued to show rapid expansion in 2002, which was a major cause of the increase in steel demand (Hungarian Central Statistical Office, 2003, p. 341). An increasing international demand for iron and steel scrap also was a source of scrap availability problems for Ozd during the year (Metal Bulletin, 2002a, d).

Although plans were developed in 2001 to privatize Dunaferri Dunai Vasmű Rt., which was Hungary's largest integrated steel producer, few parties were interested owing to the company's low profitability and a capital requirement that amounted to about \$750 million (Metal Bulletin, 2001a). By yearend, Dunaferri's cumulative debt amounted to about \$52 million. In 2001, capital improvement at Dunaferri showed mixed results. A program to modernize a 480,000-t/yr-cold-rolling mill was scheduled to begin in December at DVVA Dunaferri-Voest-Alpine Hideghengermű Kft (DVVA), which was a joint venture created by Dunaferri (60%) and Voest-Alpine Stahl AG of Austria (40%). The modernization program, which will take about 2 years to complete and cost about \$7 million, will focus on upgrading its skin pass mill to raise the quality of the cold-rolled strip (Metal Bulletin, 2001b, c).

Dunaferri's request for funds to rebuild its coke ovens, however, was not approved by the state privatization organization, APV Rt, and Dunaferri's managing agency, which restricted outlays for capital investments to capital generated from profits (Reuters, 2002).

Industrial Minerals

Hungary produced a broad range of industrial minerals that included aggregates, bentonite, kaolin, and perlite. Such industrial minerals as construction aggregates and cement continued to play an important role in Hungary's economy, especially in view of their role in the modernization process necessary for the country's infrastructure. Highway construction planned through 2008 would continue to be an important element.

Mineral Fuels

Domestically produced coal, natural gas, and petroleum have accounted for 40% of Hungary's energy needs. Hungary produced more than 1 million metric tons per year of crude petroleum from reserves that amounted to about 22 Mt; most petroleum (9 Mt), however, was imported from Russia via the Friendship Pipeline. Similarly, a substantial and increasing amount of natural gas was being imported from Russia through Russia's gas main network (Molnar, 2002).

Hungary classifies its coals into three categories—bituminous, brown, and lignite; the latter two are subbituminous. Brown coal and lignite were mined, for the most part, to fuel the country's thermal electric power stations. Lignite was mined by open pit at the Bukkabrany and the Visonta Mines; the output from these mines was used entirely at the Matra electric powerplant. The mines and the electric powerplant have been owned by RWE/EVS, which was a German consortium (Molnar, 1999, 2001). As of January 1, 2002, resources of subbituminous and bituminous coals amounted to about 3,200 Mt and 197 Mt, respectively (Molnar, 2003).

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POLAND

Poland was endowed with significant mineral resources, which included bituminous coal, copper and lead and zinc ores, salt, silver, and sulfur. The country's reserve base of copper amounted to about 6% of the world total, and that of elemental sulfur represented about 9% of the total (Edelstein, 2004; Ober, 2004). Resources of coal and salt were considered to be of world significance, and those of silver, lead, and zinc amounted to about 24%, 4%, 2%, respectively, of the world totals. An inventory of the country's mineral resources for 2002 indicated net gains in geologically documented resources mainly for gravel aggregates and natural gas (table 7).

Poland, after Russia, was the leading producer of copper in Europe and Central Eurasia in 2002 and remained among the top 10 world producers of copper in terms of mine output (Edelstein, 2004). Poland also continued to be among the world's leading producers of nitrogen (in ammonia), salt, silver, and sulfur. In Europe and Central Eurasia, the country was a significant producer of lead and zinc and a leading producer of lime. According to the most recent available data (2001), Poland accounted for more than 4.0% of the total world output of bituminous coal [Główny Urząd Statystyczny (Central Statistical Office), 2003a, p. 722].

According to the International Monetary Fund, Poland's economy registered a growth of 2.3% of the gross domestic product (GDP) (purchasing power parity) compared with that of 2001 (4.0%). The value of industrial production increased by about 1.1% compared with that of 2001 [Główny Urząd Statystyczny (Central Statistical Office), 2003a, p. 583]. The gross output of industry represented about 22% of the GDP; the output of the mining and quarrying sector accounted for about 2% of the GDP. Following a 19% increase in investment (constant prices) in 2001 compared with that of 2000, investment in the mining and quarrying sector in 2002 contracted by about 5.6% compared with the preceding year. The sales value (constant prices) of industrial mineral products, coke and refined petroleum, and base metals accounted for 4.6%, 4.0%, and 3.5%, respectively, of total industrial sales in 2002 [Główny Urząd Statystyczny (Central Statistical Office), 2003a, p. 407].

Total sales by the mining and quarrying sector (constant prices) for the year decreased by about 3% compared with those of 2001; sales by the coal, lignite, and peat mining industries fell by about 5.8%. Sales of industrial minerals increased by about 4.9% compared with those of 2001; sales of coke and refined petroleum and base metals collectively declined by about 16% and 4.4%, respectively [Główny Urząd Statystyczny (Central Statistical Office), 2003a, p. 408].

Government Policies and Programs

The Government of Poland remained committed to privatizing fully the country's iron and steel industry. In 2002, the total number of mining enterprises increased to 742 from 695 in 2001; the number of state-owned enterprises declined to 33 from 35 in 2001 (Ney and Smakowski, 2003, p. x). Joint stock companies, limited liability companies, and partnerships constituted about 80%, 11%, and 4%, respectively, of the total mining enterprises. Steel trade issues and efforts to restructure and privatize Poland's steel industry continued to be among the leading mineral industry concerns during the year.

Production and Trade

As in 2001, Poland's production of minerals showed mixed results. The metals sector reported output increases of aluminum, cadmium, copper (concentrate and refined), lead concentrates, and silver. The production of crude steel, total electric furnace ferroalloys, and pig iron declined compared with respective levels of output in 2001. Among industrial minerals, production increases were reported for barite (production from processed tailings), feldspar, kaolin, and salt among others. The production of most industrial minerals, however, declined compared with respective output levels of 2001. With the exception of natural gas, production gains were not reported in the mineral fuels sector (table 5).

Although Poland was a leading European producer and processor of minerals and mineral fuels, the country still depended heavily on imports to meet demand. According to the Mineral and Energy Economy Research Institute of Poland's Academy of Sciences, of the 130 mineral commodities that were reviewed, 50 (38%) were in the category of total import dependence. Additionally, 14

commodities (11% of the total) were in the category of import dependence that ranged from more than 50% to about 99% of demand (Ney and Smakowski, 2003, p. xii, xvii).

In 2002, Poland's mineral imports included petroleum (\$2.9 billion), natural and associated gas (\$1.2 billion), unwrought aluminum and aluminum alloys (\$227 million), and iron ore and concentrates (\$182 million). Major mineral exports were bituminous coal (\$816 million), refined copper (\$419 million), silver (\$185 million), and iron, and iron and steel scrap (\$164 million) (Główny Urząd Statystyczny (Central Statistical Office), 2003b, p. 154-500; Ney and Smakowski, 2003, p. xxiii). Poland's overall mineral trade deficit in 2002 amounted to more than \$3 billion. Given the anticipated increases in demand for aluminum, iron ore, natural gas, and petroleum, the mineral trade debt was expected to increase.

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—Poland's primary aluminum, which was produced in Konin at Aluminium Konin-Impexmetal S.A. (Konin), was based entirely on imported alumina. A modernization program that was completed at Konin in 2000 set production capacity at 55,000 metric tons per year (t/yr) for primary aluminum and 80,000 t/yr for rolled products (Ney and Smakowski, 2003, p. 22). In 2002, primary and secondary aluminum output declined by about 1%, and 2%, respectively (table 5). An addition of imports and exports of primary and secondary aluminum to aluminum production yielded a demand (apparent consumption) of about 136,000 metric tons (t) of primary and secondary unwrought aluminum in 2002. Poland's unwrought aluminum demand had risen steadily between 1996 and 2002 except for 2001 when it was unchanged from the preceding year (Ney and Smakowski, 2003, p. 21).

Trade turnover in unwrought primary and secondary aluminum, however, was a subset of total exports and imports of aluminum and aluminum products. In 2002, imports of aluminum and aluminum products totaled about 374,000 t, which was an increase of about 21% compared with those of 2001. Exports of aluminum and aluminum products totaled about 264,000 t; this was about a 15% increase compared with those of the preceding year (tables 7, 8).

Imports of bauxite in 2002 amounted to about 50,000 t and, given that no exports were recorded, were equivalent in volume to bauxite consumption during the same period. Bauxite was used to produce aluminous cement, abrasives, and refractory products. In 2002, bauxite imports rose by about 31% compared with those of 2001 (Ney and Smakowski, 2003, p. 46).

Alumina imports amounted to about 123,000 t and were chiefly used in primary aluminum production. A small amount (less than 15%) was used in the nonmetallurgical sphere (cement, chemicals, glass, and refractories) (Ney and Smakowski, 2003, p. 48).

Cadmium.—Because of its association with sphalerite, cadmium was produced as a byproduct of lead and zinc mining and processing operations in the Silesia-Cracow region. In 2002, refined cadmium production at Huta Cynku "Miasteczko Slaskie" amounted to about 440 t, which was an increase of about 33% compared with that of 2001. Cadmium consumption rose by almost threefold compared with that of 2001 and constituted about 89% of production. Cadmium reserves as of December 31, 2002, were reported at 66,450 t, of which 21,990 t was worked (Ney and Smakowski, p. 65).

Copper.—All copper ore in Poland was mined by Kombinat Gorniczo Hutniczy Miedzi (KGHM) Polska Miedz S.A. (KGHM), which was a major world copper mining, beneficiation, smelting, and refining complex in the Lubin area. KGHM accounted for almost 4% of world mine copper production in 2002. The ore was worked by using the room-and-pillar method at the Lubin, the Polkowice-Sieroszowice, and the Rudna Mines. Five deposits were mined at depths that ranged from 600 to 1,200 meters. Chalcocite is the principal ore mineral; smaller amounts of bornite and chalcopyrite also are present. The mineralization is mainly in the shale horizon but extends also into the overlying carbonate and underlying sandstone layers. As of December 31, 2002, total copper ore resources were 2.4 billion tons (Gt) and contained about 48 million metric tons (Mt) of copper. Reserves under exploitation were about 1.5 Gt that contain 30 Mt of copper (table 7). In 2002, ore grades ranged from 1.86% to 2.01% copper (Ney and Smakowski, 2003, p. 126).

The Rudna Mine was KGHM's largest ore producer with the capacity to produce about 12.8 million metric tons per year (Mt/yr) of copper ore. The concentrator at Rudna processed Rudna ores and some ores from the Polkowice-Sieroszowice Mine; its capacity was rated to produce about 700,000 t/yr of concentrate. Annual output by the Polkowice-Sieroszowice Mine and concentrator amounts to about 8.5 Mt of ore and 450,000 t of concentrate. The Lubin Mine accounted for about 7.5 Mt/yr of ore to produce about 465,000 t/yr of concentrate (Ney and Smakowski, 2003, p. 128-129).

In 2002, Poland's production of copper (in ore) increased by about 6% compared with that of 2000. Similarly, copper recovered in concentrate increased by 6%, and primary smelter copper production, by more than 5%. The output of secondary smelter copper registered a substantial increase of about 5.4% to 29,400 t from 27,900 t in 2001. The total output of electrolytically refined copper (primary and secondary) increased by about 2.1% compared with that of 2001. The output of copper cathode increased by about 2.2% compared with that of 2001; secondary refined copper declined to 19,000 t from 31,000 t produced in 2001 [Główny Urząd Statystyczny (Central Statistical Office), 2003a, p. 413].

Trade data for 2002 shows that Poland's net exports of unwrought refined copper and copper alloys amounted to 264,000 t (valued at about \$450 million), which was an increase of 15% compared with that of 2001. Although exports of copper manufactures and semimanufactures declined by about 14%, total copper exports rose by 9.3% during the same period [Główny Urząd Statystyczny

(Central Statistical Office), 2003b, p. 143]. In 2002, the principal importers of copper from Poland remained, in order of volume, France, Germany, China, and Austria. China's imports of copper from Poland amounted to about 45,000 t, which was an increase of about 29% compared with those in 2001 and more than twice the amount imported in 1998. In 2002, Poland's apparent consumption of refined copper declined back to the demand level of 2000 (about 246,000 t) (Ney and Smakowski, 2003, p. 131-133).

In 2002, the downsizing of diversified noncore businesses at KGHM was among the chief issues during the year. In March, a company spokesperson announced plans to sell off noncore businesses, which would allow KGHM greater scope for developing its copper and silver production operations. These plans would include the development of the Glogow Glebokki deposit, which had reserves that were estimated to be about 204 Mt of ore that contained more than 5 Mt copper (Metal Bulletin, 2002d).

Gold.—In 2002, Poland's gold production continued to be based almost entirely on the country's copper mining operations. The gold content of the copper concentrates produced by KGHM were reported to be about 1 gram per metric ton; total reserves were reported as 50 t (Ney and Smakowski, 2003, p.197-199). Byproduct gold produced at KGHM's copper refineries declined by about 15% in 2002 compared with that of 2001. The gold was recovered at KGHM's 550-kilogram-per-year (kg/yr) precious-metals plant, which was a division within the Glogow smelter and refinery. The amount of gold recovered at Glogow has varied with changes in the proportion of copper ores produced at the three mines, each of which has a different average gold content. Poland's domestic consumption of gold in recent years was in the range of about 260 to 389 kg/yr.

Iron and Steel.—In 2002, the output of pig iron and crude steel continued to contract. Output levels of crude steel and pig iron declined by 5% and 3%, respectively, compared with those of 2001. Hot-rolled steel output declined by about 7% (table 5).

Poland depended entirely on imported iron ores and concentrates, which in 2002 amounted to about 7 Mt. Poland also depended entirely on imports of manganese (15,000 t), chromite (9,000 t), and titanium (74 t) ores to produce the ferroalloys (table 8; Ney and Smakowski, 2003, p. 468).

In 2002, Poland's iron and steel sector continued to undergo denationalization. As an outcome of the Iron and Steel Restructuring Program—Update 2002, which was the plan adopted by the Government of Poland to rationalize the steel industry for accelerated privatization, Polskie Huty Stali S.A. (PHS), which was a state-treasury-owned holding company, was created. PHS's holdings initially comprised Huta Cedler S.A., Huta Florian S.A., Huta Katowice S.A., and Huta im. T. Sendzimira S.A. In the early part of the year, PHS acquired Huta Czestochowa S.A. as part of its operation for streamlining the steel industry (Metal Bulletin, 2002e, g).

Although Poland's steel industry lagged behind the steel industries of the European Union (EU) with respect to energy, labor, and material inputs in the steel production process, significant improvements were achieved owing to the capital investments (\$2.7 billion) that were made in the steel sector from 1991 to 2002. Open-hearth steelmaking declined to virtually nil by 2002 from about 25% of total steel production in 1991; continuous casting increased to 74% of total casting in 2002 from about 8% in 1991. The Iron and Steel Restructuring Program was developed with the view of easing Poland's entry into the EU by developing industrial conformity with EU standards and making the steel industry economically viable by 2006. The EU's European Commission (EC) reportedly audited and approved the restructuring program in 2002 (Ney and Smakowski, 2003, p. 239).

In 2002, financial difficulties, which included rising debts (incurred largely as an outcome of adjustment to a market driven economy), were a major issue in the steel sector and were centered on Huta Czestochowa, Huta Katowice, and Huta Ostrowiec (Metal Bulletin, 2002a-c).

Investor interest in Poland's steel sector, however, remained active despite its financial difficulties. Ispat International of the United Kingdom and a consortium that comprised Arcelor SA of Luxembourg, ThyssenKrupp Stahl AG of Germany, and Salzgitter AG of Austria, which were involved in acquisition negotiations with the Government of Poland in 2001, continued to express interest in acquiring Poland's steel industry assets in 2002 (Arcelor SA, 2002). In 2002, U.S. Steel Kosice S.R.O. (USSK) (a subsidiary of U.S. Steel) also expressed interest in acquiring PHS's assets. The Government of Poland indicated that one of the terms of sale of 51% of PHS's assets would be a commitment by the prospective new owner to invest about \$350 million in new equipment. PHS's net asset value, discounting total debt, was estimated to be about \$1.3 billion. By yearend, Ispat and USSK emerged as the principal bidders for PHS's assets (Green, 2002; Metal Bulletin, 2002k).

Other issues pertinent to the steel industry included an agreement with the EC to end subsidies to the steel industry and to reduce total crude steel output by about 900,000 t by 2006, which were among the issues under negotiation relative to Poland's entry into the EU (Metal Bulletin, 2002f, i). The Government also adopted temporary import quotas on iron and steel products with tariff rates that were in accord with those of the EU and that took into account (average) tariff rates applied to member as well as non-member countries of the World Trade Organization. A final decision on steel import tariffs was to be made in early 2003 (Metal Bulletin, 2002j).

Foreign commercial activities included negotiations conducted between several Polish steelmakers and Companhia Vale do Rio Doce (CVRD) of Brazil, which was a major producer of iron ore, to establish trade on an iron-ore-for-steel-rail basis and to create a Brazilian-Polish joint venture to expand bulk berthing capacity at Poland's Gdansk and Gdynia seaports (Mining Journal 2002).

Lead and Zinc.—Poland worked 3 of the 21 known lead-zinc deposits in the Silesia-Crakov area, which held 41 Mt of ore out of a total resource of about 180 Mt of lead and zinc ore. Additionally, lead and zinc were associated with and recovered from copper ore mined by KGHM in the Lubin region. About 39% of total mined lead came from copper mining and processing. Despite a presence of sphalerite in KGHM's copper deposits, the low zinc content of the ore had made metal recovery uneconomical. In 2002, overall mine production of lead and zinc ore decreased slightly compared with that of 2001. Mine production of lead from lead-zinc deposits

rose to about 74,000 t from 70,000 t in 2001 (6%); mine production from main copper ore deposits, however, declined to about 47,000 t from 52,000 in 2001 (10%). Lead recovered in concentrates increased by 8% to almost 57,000 t (Ney and Smakowski, 2003, p. 255-264). The total output of smelter lead (pig) increased by 5.4% compared with that of the preceding year; secondary smelter lead production constituted about 60% of the total and increased by about 13% compared with that of 2001. The total output of refined lead (primary and secondary) remained approximately at the production level of 2001. In 2002, the volume of imports of refined lead was about equal to refined lead exports, which resulted in an approximate demand at yearend of 65,200 t, which was 5% less than that of 2001 (tables 7, 8).

Zinc was obtained from lead and zinc ores in the Silesia-Cracow region from two underground mines. The Olkuz-Pomorzany Mine, which is located near Olkusz and was part of the Zakłady Górnictwo Hutnicze Bolesław operation, produced ore that graded 1.69% lead and 4.2% zinc, and the Trzebieńka Mine and concentrator at Trzebieńka produced ore that graded 1.67% lead and 3.4% zinc. The volume of mine production of lead (lead in ore) increased by 6% compared with that of 2001, and that of concentrates (lead content), by 8%. The volume of mine output of zinc ore, however, declined by about 1%, and that of concentrates remained at about the same output level that of 2001. The decline in zinc mine production was attributed mainly to depletion of the ore (Ney and Smakowski, 2003, p. 489-492).

In 2002, Poland produced 80,200 t of smelter refined zinc (slightly more than 50% of total refined zinc), which was a slight increase (1%) compared with that of 2001. Electrolytically refined zinc production totaled to almost 79,000 t, which was a decrease of 17% (Ney and Smakowski, 2003, p. 494). In 2002, total imports of zinc and zinc-lead concentrates, in terms of gross weight, amounted to 112,200 t (about 67,400 t of zinc), which was a decline of about 4%. The main suppliers of zinc concentrates to Poland were, in descending order, Romania, Canada, and Honduras. Poland's exports of zinc concentrates amounted to 61,400 t (about 33,600 t of zinc). Exports of zinc in all forms, which included fabricated items, amounted to 89,000 t and had a value of about \$75 million.

Given a concentrate production of about 152,200 t (zinc content), concentrate demand declined by 10% to 186,000 t in 2002. Demand for zinc metal declined by 5% to 88,500 t (Ney and Smakowski, 2003, p. 258-299, 491).

One of the underlying issues in the zinc sector was the closure of Huta Metali Nieżelaznych "Szopienice" (HMN), which was one of the country's three zinc smelters. The closure was attributed to declining market prices for zinc and to inefficient and out-of-date technology at the facility. HMN had the capacity to produce about 30,000 t/yr of refined zinc (Metal Bulletin, 2002h).

Silver.—In 2002, Poland was among the major world producers of silver and accounted for about 6% of world mine production (Hilliard, 2004, p. 151). Copper and, to a lesser extent, lead and zinc mining were Poland's domestic sources of primary silver. The country's copper mining, smelting, and refining complex, which was operated by KGHM in the Lubin area, produced 1229 t in 2002 (about 98% of the total output). Poland's exports of silver in 2002 amounted to 1,135 t and had a net value of more than \$181 million. The top three importers of Polish silver were, in order of value, the United Kingdom, Germany, and Belgium [Główny Urząd Statystyczny (Central Statistical Office), 2003b, p. 147, 513].

Industrial Minerals

Poland produced a broad range of industrial minerals that included calcareous and silicate rocks and aggregates, clays, feldspar, gypsum, magnesite, salt, and sulfur, which served the needs of the country's chemical and construction industries. Poland remained among the leading world producers of lime, nitrogen (in ammonia), salt, and sulfur (Kostick, 2004; Kramer, 2004; Miller, 2004; Ober, 2004).

Sulfur.—Poland's native sulfur production declined substantially in 2001 following the closure of two of the country's three main mine producers. In 2002, native sulfur declined further to 760,000 t (19%). The total output of elemental sulfur (native and byproduct) declined by about 15% to 940,000 t compared with that of 2001. In 2002, sulfur consumption increased by about 2% compared with that of 2001 [Główny Urząd Statystyczny (Central Statistical Office), 2003b, p. 446].

Mineral Fuels

Coal.—Poland remained a significant world producer of coal and accounted for about 3.1% of the world's output of bituminous coal and about 6.9% of total world output of lignite [Główny Urząd Statystyczny (Central Statistical Office), 2002a, p. 492]. In 2002, the country's production of bituminous coal and lignite amounted to 104 Mt and 60 Mt, respectively. Bituminous coal production remained at the 2001 level of output. The production of lignite was somewhat less. The country's net exports of anthracite and bituminous coal amounted to about 20 Mt, which was a decline of 6.4% compared with those of 2000. The major importers of Polish coal were, in order of volume, Germany, Austria, and Finland (Ney and Smakowski, 2003, p. 217-223).

Poland's bituminous coal was mined in three basins of Late Carboniferous age. The Upper Silesian, the Lower Silesian, and the Lublin Basins have exploitable resources of 44,100 Mt of coal in 128 deposits. The Upper Silesian Basin represents the major portion of the country's total reserves with 79% of the total in 110 deposits (Ney and Smakowski, 2003, p. 217-218).

In 2001, the World Bank for Reconstruction and Development agreed to provide the Government of Poland a \$100 million loan to help finance the Hard Coal Reform Program; this was the second phase of a reform plan that called for streamlining the industry with closures of unprofitable mines and workforce reductions and retraining (Metal Bulletin, 2001; World Bank for Reconstruction and Development, 2001, p. 14).

Natural Gas and Petroleum.—The production of natural gas increased by about 1.6%; petroleum extraction, however, declined by 6% compared with that of 2001. Poland depended on imports to meet its needs for oil and gas. In 2002, Poland's imports of petroleum increased to more than 17.9 Mt, or by 2%, compared with those in 2001; those of natural gas, however, decreased by about 7%. In 2002, the Russia remained Poland's chief source of supply of both hydrocarbons. Russia supplied about 96% and 86%, respectively, of Poland's imports of petroleum and natural gas (Ney and Smakowski, p. 177, 325).

Exploration activity for hydrocarbons in 2001 included the Government's initiation of a third round of bidding for 17 exploration blocks in the central and northwestern parts of Poland. In 2000, the Government awarded 15 exploration locks in the southeastern part of the country; EuroGas Inc. of the EU obtained 10 of the 15 exploration blocks (Oil & Gas Journal, 2001a). In February, gas production began at the Kleka 11 well. The initial rate of production was 2 million cubic feet per day and was expected to reach 4 million cubic feet per day by 2003. Fx Energy Inc. of the United States owned a 49% interest in the Kleka 11 well; the balance was owned by Polskie Gornictwo Naftowe i Gazownictwo w Warszawie S.A. (Polish Oil & Gas Co.) (Oil & Gas Journal, 2001b, p. 44). Other issues relative to the natural gas and petroleum sector included the continuing formal discussion that concerned the diversification of Poland's supply of natural gas. The EU's accession requirements for applicant countries stipulate that natural gas imports must come from at least two different sources.

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SLOVAKIA

Slovakia continued to be a modest regional producer of a variety of minerals. Aluminum and steel production formed the dominant elements in the country's metals sector. Production of steel was based mostly on imported raw materials, and that of aluminum was based entirely on imported bauxite and alumina. Small quantities of copper, gold, lead, and zinc also were produced. Industrial minerals production included barite, clays, magnesite, and salt. Slovakia's production of mineral fuels comprised brown coal, lignite, and minor quantities of gas and petroleum (table 10).

The economy of Slovakia continued to develop towards a full market system. The need to denationalize the state's commercial assets and to reduce subsidies to the public sector expeditiously often was tempered by policies promulgated to maintain social stability that often resulted in increased public sector employment and by uneven economic performance. In 2002, Slovakia's gross domestic product (GDP) increased by 4.4% (constant prices) compared with that of 2001. Industrial production in 2002 continued to show recovery with a growth rate of 7.4% compared with that of 2001; the value of output of the mining and quarrying sector declined by about 1%. The output value of metal products also declined by about 8% compared with that of 2001. The output value of the mining and quarrying sector as a percentage of GDP was about 0.6% compared with 14% in 2001. The contribution of the mining and quarrying sector to the national economy has been gradually but steadily declining since 1995 (International Monetary Fund, 2003).

Slovalco a.s. was Slovakia's sole producer of primary aluminum. The enterprise, which was originally known as ZSNP Aluminum Works, was put into full operation in 1953. Following the restructuring of the ZSNP's assets in 1993, Slovalco became a subsidiary of

ZSNP and was solely involved in primary aluminum production. After 1993, Slovalco began a program of modernization and facility expansion that garnered investment capital from the European Bank for Reconstruction and Development (EBRD) and Hydro Aluminium AS of Norway. Hydro and EBRD acquired 14.5% and 10% of Slovalco's shares, respectively; the balance remained with ZSNP (Slovalco a.s., 2000, p. 5-8). In 2001, following an agreement among Slovalco's shareholders, Hydro and EBRD acquired the majority (40% each) of Slovalco's shares, and ZSNP was to retain ownership of 20%. A provision in the transaction gave Hydro the option of acquiring EBRD's shares if exercised by yearend 2006. This transaction also allowed ZSNP to restructure its bank debts (Slovalco a.s., 2001, p. 18). In 2002, the National Property Fund of Slovakia offered ZSNP's shares for sale that included ZSNP's remaining interest in Slovalco.

Planned facility expansion at Slovalco included the addition of 54 new reduction cells to that would raise capacity by 36,000 metric tons per year (t/yr) to 146,000 t/yr by 2003. Other modernization programs were expected to raise production capacity at Slovalco to 155,000 t/yr by 2004. Casthouse products that used primary and secondary aluminum also were expected to reach a 178,000-t/yr production level in 2004 (Metal Bulletin, 2001a).

Slovakia's only gold mining operation, which was located at Banská Hradská, was terminated in mid-2001. Slovenská banská spol. s r.o., which mined the Svetozar gold ore deposit, ended production mainly because of depletion but also owing to a lack of working capital needed for exploration work. In 2002, the company's operations were in the process of full termination. Some gold reportedly was produced from stockpiled ore; the gold output amounted to about 77 kilograms, which was less than 50% of that produced in 2001 (Balaz, Bartolomej, 2003).

The output of iron pellets and concentrate declined by about 25% compared with that of 2001 (Balaz, Bartolomej, 2003). Slovakia's production of iron ore concentrate and pellets from domestic sources in 2002 satisfied less than 7% of the country's industrial needs. Slovakia's total resources of siderite amounted to about 94 million metric tons (Mt), of which about 23 Mt was classified as reserve ore. Ukraine and Russia were Slovakia's main suppliers of iron ore and concentrate and accounted for 52% and 47%, respectively, of total imports that amounted to about 5,000,000 metric tons (Balaz, Peter, 2003, p. 71, 72).

U.S. Steel Kosice began discussions during the year with Polish officials concerning Kosice's acquisition of Polish steel-producing assets that included Huta cedler, Huta Katowice, Huta Florian, and Huta Sendzimira (Metal Bulletin, 2002).

In the mineral fuels sector, a slight production decline of brown coal was reported for 2002 compared with that of 2001. Natural gas and petroleum production showed mixed results given the slight increase in natural gas output but the decrease in petroleum production of about 4% (Balaz, Bartolomej, 2003). Russia, which remained Slovakia's chief supplier of natural gas and petroleum, accounted for more than 98% of the country's imports of these fuels.

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TABLE 1
CZECH REPUBLIC: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	1998	1999	2000	2001	2002
METALS					
Aluminum, secondary ^c	45,000	40,000	40,000	20,000	20,000
Copper, refined, secondary ^c	20,000	23,037	20,000	18,000	18,000
Gold metal kilograms	--	3,207	3,000	2,000	2,000
Iron and steel:					
Iron ore:					
Gross weight thousand tons	26	23	21	20	--
Fe content ^c	7,000	6,000	6,000	6,000	--
Metal:					
Pig iron thousand tons	4,982	4,022	4,621	4,677	4,840 ³
Ferroalloys, total electric furnace ^c do.	1	1	1	1	1
Steel, crude do.	6,498	6,107	6,216	6,316	6,512 ³
Total semimanufactures do.	10,205	10,207	11,637	12,645	12,500
of which hot-rolled products do.	5,129	4,722	4,546	5,265	5,489 ³
Lead, metal, secondary	20,000	29,280	25,000	25,000	25,000
Silver	--	24	25	25	25
Uranium, mine output, U content	611	605	498	490 ^r	477 ³
Zinc metal, secondary	1,000	145	150	250	250
INDUSTRIAL MINERALS					
Cement, hydraulic thousand tons	4,604	4,241	4,093	3,550	3,217 ³
Clays:					
Bentonite do.	125	160	280	224 ^r	174 ³
Kaolin do.	3,049	5,183	5,573	5,543 ^r	3,650 ³
Other do.	1,030	1,070	1,120	585 ^r	564 ³
Diatomite	35,000	37,000	34,000	83,000 ^r	28,000 ³
Diamond, synthetic ^c carats	5,000	5,000	5,000	5,000	5,000
Fertilizer, manufactured:					
Nitrogenous, N content	247,000	220,000	257,000	250,000	250,000
Phosphatic, P ₂ O ₅ content	80,000	100,000	100,000	100,000	100,000
Potassic, K ₂ O content	20,000	20,000	20,000	20,000	20,000
Mixed	100,000	77,000	75,000	75,000	75,000
Feldspar	266,000	244,000	337,000	373,000 ^r	401,000 ³
Gemstones, crude, pyrope-bearing rock	43,000	54,000	62,000	47,000 ^r	52,000 ³
Graphite	28,000	22,000	23,000	17,000 ^r	16,000 ³
Gypsum and anhydrite, crude	222,000	136,000	82,000	24,000 ^r	108,000 ³
Lime, hydrated and quicklime thousand tons	1,151	1,142	1,202	1,300 ^r	1,120 ³
Nitrogen, N content of ammonia ^c	250,000	250,000	250,000	250,000	250,000
Quartz	1,000	3,000	--	--	-- ³
Salt ^c	--	--	--	--	--
Sand and gravel:					
Common sand and gravel thousand cubic meters	9,279	12,781	12,640	12,100 ^r	12,464 ³
Foundry sand thousand tons	815	717	829	771 ^r	676 ³
Glass sand do.	827	980	985	974 ^r	853 ³
Stone:					
Basalt (for casting)	96,000	89,000	14,000	15,000	15,000
Dimension stone thousand cubic meters	305,000	300,000	320,000	300,000 ^r	285,000 ³
Limestone and other calcareous stones thousand tons	11,558	11,703	11,808	10,887 ^r	10,186 ³
Building Stone thousand cubic meters	9,528	9,442	9,451	10,500 ^r	10,600 ³
Sulfur, byproducts, all sources ^c	40,000	40,000	40,000	40,000	40,000
Sulfuric acid	327,000	350,000	350,000	220,200 ^r	240,524 ³

See footnotes at end of table.

TABLE 1--Continued
CZECH REPUBLIC: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity		1998	1999	2000	2001	2002
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand tons	19,521	17,227	17,028	14,808 ^r	14,097 ³
Brown and lignite	do.	51,953	45,370	51,063	51,643 ^r	49,335 ³
Coke	do.	4,009	3,340	3,411	3,519 ^r	3,536 ³
Fuel briquets from brown coal	do.	325 ^r	288	253	280 ^r	302 ³
Gas:						
Manufactured, all types ^c	million cubic meters	800	800	800	800	800
Natural, marketed ⁴	do.	137	143	118	101 ^r	91 ³
Petroleum:						
Crude:						
As reported	thousand tons	172	176	168	178 ^r	253 ³
Converted	thousand 42-gallon barrels	1,167	1,197	1,142	1,100	1,620
Refinery products ^c	do.	35,000	35,000	35,000	35,000	35,000

^cEstimated. ^rRevised. -- Zero.

¹Table includes data available through December 2003. In addition to the commodities listed, arsenic, dolomite, illite, sodium compounds, sulfuric acid, talc, and zeolite are produced, but information is inadequate to make reliable estimates of output levels.

²Produced as a byproduct from noncopper ores.

³Reported figure.

⁴Includes gas produced from coal mines. Gross output of natural gas is not reported, but is believed to exceed reported marketed output by an inconsequential amount.

TABLE 2
CZECH REPUBLIC: STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities ¹	Annual capacity
Bentonite	Keramost a.s.	Most	150
Cement	Bohemia, Cizkovice, Hranice, Karlov Dvor, Lochkov Pracovice, and Velary	Bohemia	3,500
Do.	Bystre, Malomerice, Mokra, Ostrava-Kunice, and Zahorie	Moravia	2,800
Clay, kaolin	Mines in Karlovy vary area	Western Bohemia	450
Do.	Mines in Plzen area	Central Bohemia	150
Coal:			
Bituminous	Mines in OKD coal basin	Ostrava-Karvina, north Moravia	22,100
Do.	Mines in KD coal basin	Kladno, central Bohemia	3,000
Brown	SHD administration	Most, northwest Bohemia	61,000
Do.	HDB administration	Sokolov, western Bohemia	17,000
Lignite	JLD administration	Hodonin, southern Moravia	5,000
Copper, ore	Zlate Hory	North Moravia	300
Graphite	Grafitove dole Stare Mesto, s.r.o.	Velke Vrbno-Konstantin, northern Moravia	35
Mica	GARMICA s.r.o.	Netolice	5
Lead-zinc, ore	Horni Benesov and Zlate Hory	do.	400
Lead, metal, secondary, refined	Kovohute Pribram	Pribram	26
Natural gas	billion cubic meters Gasfields around Hodonin	Southern Moravia	25
Petroleum:			
Crude	Oilfields around Hodonin	do.	160
Refinery	thousand barrels per day Kolin, Kralupy, Pardubice, and Litvinov	Bohemia	200
Steel, crude	Nova Hut s.p. Ostrava	Kunice-Ostrava	3,800
Do.	Zelezarne Vitkovice	Vitkovice-Ostrava	900
Do.	Trinecke Zelezarny (Trinecke Iron and Steel Works)	Trinec	3,000
Do.	Poldi United Steel Works	Kladno-Prague	1,700
Do.	Zelezarny Bila Cerkev	Hradek-Rokycany	300
Do.	Zelezarny Veseli, a.s.	Veseli and Moravou	300
Do.	Zelezarny Chomutov s.p.	Chomutov	350
Do.	Bohumin Iron and Steel Works	Bohumin	400
Titanium dioxide	Precheza A.S	Precheza	25
Uranium	DIAMO s.p.	Straz pod Ralskem	2

NA Not available.

¹Names and locations of mines and crude oil refineries are identical.

TABLE 3
HUNGARY: PRODUCTION OF MINERAL COMMODITIES^{1, 2}

(Metric tons unless otherwise specified)

Commodity ³	1998	1999	2000	2001	2002
METALS					
Aluminum:					
Bauxite, gross weight thousand tons	909	935	1,046	1,000	720 ⁴
Alumina, gross weight, calcined basis do.	138	295	357	300	220
Metal:					
Primary	35,000	34,000	33,850	34,000 ^r	35,000
Secondary	64,000	54,000 ^r	55,000	76,000 ^r	75,000
Total	99,000	88,000	88,850	110,000	110,000
Copper, metal, refined including secondary ^e	12,000	12,000	12,000	12,000	10,000
Iron and steel, metal:					
Pig iron thousand tons	1,258	1,309	1,340	1,225 ^r	1,334 ⁴
Ferroalloys ^{e, 5}	8,000	8,000	8,000	8,000	8,000
Steel:					
Crude thousand tons	1,940	1,813	1,969 ^r	2,056	2,141 ⁴
Semimanufactures, rolled only do.	2,346	1,954	1,900	1,900	1,900
Manganese ore:					
Run of mine:					
Gross weight	34,000	41,000	41,000	38,000 ^r	40,000
Mn content ^e	8,900	11,000	11,000	10,000 ^r	10,000
Concentrate:					
Gross weight	15,000 ^e	15,000	15,000	15,000	15,000
Mn content ^e	5,000	5,000	5,000	5,000	5,000
Uranium, U ₃ O ₈ content	100	--	--	--	--
INDUSTRIAL MINERALS					
Cement, hydraulic thousand tons	2,999	2,978	3,358	3,452 ^r	3,510 ⁴
Clays:					
Bentonite:					
Raw	20,122	9,301	4,818	5,200	2,800 ⁴
Processed ^e	12,000	6,000	2,000	2,500	1,400
Kaolin, raw and washed	10,000 ^e	9,000	7,100	8,000	8,000
Gypsum and anhydrite ^e	135,000	222,000	251,000	252,000 ^r	250,000
Lime, calcined thousand tons	500 ^e	500	500 ^e	500	500
Nitrogen, N content of ammonia ^e do.	250	250	250	250	250
Perlite	130,000	148,000	150,000	151,000	140,000 ⁴
Sand and gravel:					
Gravel thousand tons	8,160	10,297	13,490	10,645 ^r	11,000
Sand:					
Common thousand cubic meters	250 ^e	250	300	300	300
Foundry	243,000	175,000	173,000	168,000	167,000 ⁴
Glass	241,434	490,400	340,000 ^r	339,000	362,000 ⁴
Stone:					
Dimension, all types ^e thousand tons	5,000	5,000	5,000	5,000	5,000
Dolomite do.	1,772	861 ^r	787	800	800
Limestone do.	4,802 ^r	382 ^r	668 ^r	700	700
Sulfur, byproduct, elemental, all sources ^e	30,000	30,000	30,000	30,000	30,000
Sulfuric acid	85,000 ^e	80,000	80,000	80,000	80,000
Talc ^e	500	500	500	500	500
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Bituminous thousand tons	877	738	744	573	726 ⁴
Brown do.	6,008	5,207	5,670	5,384	4,031 ⁴
Lignite do.	7,610	7,696	7,862	8,043	7,574
Total do.	14,495 ^r	13,641	14,276	14,000	12,331
Coke, metallurgical ^e	650	650	650	650	650

See footnotes at end of table.

TABLE 3--Continued
HUNGARY: PRODUCTION OF MINERAL COMMODITIES^{1, 2}

(Metric tons unless otherwise specified)

Commodity ³	1998	1999	2000	2001	2002
MINERAL FUELS AND RELATED MATERIALS--Continued					
Gas, natural, marketed	4,300	3,100	3,350	3,280	3,353 ⁴
Peat, agricultural use ⁵	50	50	50	50	50
Petroleum:					
Crude:					
As reported	1,258	1,243	1,128	1,064 ^r	1,050 ⁴
Converted ⁶	9,600 ^r	9,484 ^r	8,607 ^r	8,118 ^r	8,011 ^r
Refinery products ⁶	40,000	40,000	40,000	40,000	40,000

^cEstimated. ^rRevised. -- Zero.

¹Table includes data available through December 2003.

²Estimated data are rounded to no more than three significant digits; may not add to totals shown.

³In addition to the commodities listed, diatomite and a variety of other crude construction materials, such as common clays, are produced, but available information is inadequate to make reliable estimates of output levels.

⁴Reported figure.

⁵Hungary is believed to produce some blast furnace ferromanganese.

⁶Excludes refinery fuel and losses.

TABLE 4
HUNGARY: STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Alumina	Magyar Aluminium Rt. [Hungarian Aluminum Industrial Corp. (HUNGALU)]	Ajka Timfoldgyar plant, about 120 kilometers southwest of Budapest, near Lake Balaton	400
Do.	do.	Almasfuzito Timfoldgyar plant near the Czech Republic border, 63 kilometers northwest of Budapest	240
Do.	do.	Moson-Magyarovar plant, in northwestern corner of Hungary, about 12 kilometers from Austrian and Czechoslovak borders	30
Aluminum, primary	do.	Inota plant, near Varpalota, 75 kilometers southwest of Budapest	46
Bauxite	Bakony Bauxite Ltd., a subsidiary of Magyar Aluminium Rt [Hungarian Aluminum Industrial Corp. (HUNGALU)]	Bakony District, extending roughly 100 kilometers northeast along Lake Balaton	1,500
Cement	Belpatfatvalvi Cement es Meszipari Rt Heidelberg & Schwenk (Germany) and Hungarian Group, 100%	Belapatfalva, near Miskolc, 125 kilometers northeast of Budapest	1,100
Do.	Beremend Cement es Meszipari Rt Heidelberg & Schwenk (Germany) and Hungarian Group, 100%	Beremend, 45 kilometers south of Pecs	1,090
Do.	Dunai Cement es Meszmu Kft Heidelberg & Schwenk (Germany), 100%	Vac, 50 kilometers north of Budapest	1,200
Do.	Hejocsabai Cement es Meszipari Rt Holderbank (Germany) and Hungarian Group, 100%	Hejoscaba, 150 kilometers northeast of Budapest	1,450
Do.	Labatlan Cementipari kft Holderbank (Germany), 100%	Labatlan, 20 kilometers north of Tatabanya	550
Clays	Agyag-Asvany Kft Navan Resources PLC (Ireland)	Felsopeteny, one underground and two open pit mines and 5,000-tons-per-year processing plant. Products were ball clay, kaolin, and refractory clay	35
Coal:			
Bituminous and lignite	Magyar Szenbanyaszati Troszt (MSZT) (Hungarian Coal Mining Trust)	Tatabanya and Oroszlany coal mining region, 45 kilometers west of Budapest	8,900
Do.	do.	Mecsek coal mining region, near Pecs and Komlo, north of the Yugoslav border	3,100
Do.	do.	Borsod coal mining region, 130 kilometers northeast of Budapest	5,200
Lignite	do.	Thorez open cast mine at Visonta, 80 kilometers northeast of Budapest	7,000
Manganese	Orszagos Erc-es Asvanybanyak (National Ore and Mineral Mines)	Urkut manganese ore mines, 120 kilometers southwest of Budapest	160
Natural gas	million cubic feet Hungarian Oil and Gas Co. (MOL)	Szeged and Algyo gasfields, southern Hungary	152,000
Do.	do.	Hajduszoboszo gasfields, 180 kilometers east of Budapest	50,000
Do.	do.	Smaller gasfields Szank, Kardoskut, Bekes, Berefurdo, and others	39,000
Perlite	Perlit 92 Kft Navan Resources PLC (Ireland) and Hungarian Group	Open pit mine and processing plant, Palhaza, northeastern Hungary	150

TABLE 4--Continued
HUNGARY: STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(Thousand of metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Petroleum:				
Crude	million barrels	Hungarian Oil and Gas Co. (MOL Rt.)	Szeged-Algyo field, near Romanian-Yugoslav border; 50% of total capacity	7
Refined:		Subsidiaries of MOL:		
Do.	do.	Danube Petroleum Refining Co.	Szazhalombatta	55
Do.	do.	Tisza Petroleum Refining Co.	Leninaváros	22
Do.	do.	Zala Petroleum Refining Co.	Zalaegerszeg	4
Silica		Uveg-Asvany Kft. Navan Resources PLC (Ireland) and Hungarian Group	Mine and plant at Fehevársüto	660
Steel		Dunaferr Dunai Vasmu Rt	60 kilometers south of Budapest	1,400
Do.		OAM-Ozdi Acélmuvek Kft	120 kilometers northeast of Budapest	360
Do.		DAM-Diosgyori Acélmuvek és Kereskedelmi Kft	Diosgyó, 145 kilometers northeast of Budapest	850

TABLE 5
POLAND: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	1998	1999	2000	2001	2002
METALS					
Aluminum					
Primary	51,500 ^r	51,600 ^r	52,400 ^r	52,600 ^r	52,200 ³
Secondary	2,700	6,100	5,400 ^r	9,900 ^r	9,700 ³
Cadmium:					
Metal primary	--	--	6 ^r	330	440 ³
Oxide	61	27	-- ^r	--	--
Copper:					
Ore:					
Gross weight thousand tons	27,594	28,395	28,503	30,227	29,705 ³
Metal content	490,892	523,120	512,000	535,000	568,000 ³
Concentrate:					
Gross weight thousand tons	1,750	1,900 ^e	1,755	1,834	1,945
Metal content	436,200	463,200	454,100	474,000	503,000 ³
Metal:					
Smelter:					
Primary ^e	432,200 ^r	466,200 ^r	462,800 ^r	485,900 ^r	510,700 ³
Secondary ^e	19,300 ^r	27,300	19,700	27,900	29,400 ³
Total ³	451,500	493,500	482,500	513,800	540,100 ³
Refined, electrolytically, primary and secondary	446,837	470,494	486,002	498,451	508,674 ³
Gold, metal, smelter ³ kilograms	409	489	367	349	296 ³
Iron and steel:					
Pig iron:					
For foundry use thousand tons	288	197	246	98	100
For steel production do.	5,841	5,036	6,246	5,343	5,196
Total	6,129	5,233	6,492	5,440	5,296 ³
Ferroalloys, electric furnace:					
Ferrochromium	4,200	--	--	--	--
Ferrosilicomanganese	15,100	10,000	19,000	20,000	20,000
Ferromanganese:	50,152	100	--	500	500
Ferrosilicon	75,000	62,481	56,000	48,600	33,541
Other electric furnace ferroalloys	13,300	2,700	--	--	
Total	157,752	75,281	75,000	69,100	54,041 ³
Steel, crude:					
From open hearth furnaces thousand tons	494	379	424	178	169
From oxygen converters do.	6,223	5,452	6,794	5,822	5,531
From electric furnaces do.	3,197	3,022	3,290	2,809	2,667
Other do.	2	1	--	--	--
Total do.	9,916	8,854	10,508	8,809	8,367 ³
Semimanufactures:					
Hot rolled do.	6,045	6,433	7,616	6,599	6,114 ³
Cold rolled do.	1,652	1,673	1,826	1,350	1,300
Pipe do.	500	484	483	440	309
Lead:					
Pb-Zn ore, gross weight do.	5,052	5,068	4,500	4,600	4,500
Pb content of Pb-Zn ore	73,814	81,849	67,800	69,600	73,500 ³
Pb content of Cu ore	42,600	35,000	46,000	52,000	46,900 ³
Total Pb mine content	116,414	116,849	113,800	121,600	120,400
Concentrate, gross weight	90,400	104,000 ^e	84,400	86,400	85,000
Pb content	59,533	62,900	51,200	52,600	56,600 ³
Metal:					
Smelter:					
Primary	28,700	31,000	29,700	30,800	29,400 ³
Secondary	50,500	53,600 ^r	46,400	39,500	44,700 ³
Total	79,200	84,600	76,100	70,300	74,100
Refined	64,300	63,985	55,900	66,000	68,000 ³

See footnotes at end of table.

TABLE 5--Continued
POLAND: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	1998	1999	2000	2001	2002
METALS--Continued					
Palladium, average content of slimes ^{c,4} kilograms	12	12	12	12	12
Platinum, average content of slimes ^{c,4} do.	20	21	21	20	20
Selenium	67	67	65	65	68 ³
Silver, refined primary	1,108	1,100	1,144	1,190	1,229 ³
Zinc:					
Mine output, Zn content	182,349	185,689	182,000	172,300	171,200 ³
Concentrate output, Zn content	157,874	154,800	156,900	152,700	152,200 ³
Metal, refined, including secondary	174,800	178,900	173,000	174,700	158,900 ³
INDUSTRIAL MINERALS					
Barite:					
Crude	--	--	--	--	--
Beneficiated from tailings	--	500	2,000	2,500	2,700 ³
Cement:					
Clinker for cement thousand tons	11,974	11,678	11,559	9,335	8,500
Hydraulic cement do.	14,970	15,555	15,046	12,074	10,948 ³
Portland cement do.	13,934	14,310	13,802	11,115	10,000
Clays and clay products:					
Bentonite, crude	24,000	96,000	--	--	--
Fuller's earth, crude	5,400	5,000	29,700	29,000	29,000
Fire clay, crude thousand tons	175	140	153	140	130 ³
Kaolin:					
Crude do.	270	286	344	267	350
Beneficiated do.	82	89	99	129	105 ³
Diamond, synthetic thousand carats	7	--	--	--	--
Diatomite	1,531	1,200	1,300	1,000	1,000
Feldspar:					
Run of mine	26,500	9,000	54,000	69,000	70,000
Processed, including imported material	116,700	120,100	165,200	220,600	240,000 ³
Gypsum and anhydrite: ⁵ thousand tons					
Natural:					
Gypsum rock	863	926	997	794	800
Anhydride	166	237	285	300	200
Total	1,029	1,163	1,282	1,094	1,000
Synthetic gypsum	674	860	1,140	1,134	1,034
Total gypsum and anhydride	1,703	2,023	2,422	2,228	2,034 ³
Lime, hydrated and quicklime do.	2,406	2,299	2,192	1,954	1,865 ³
Magnesite:					
Ore, crude	38,300	54,800	30,000	23,000	24,000 ³
Concentrate	33,700	38,800	26,100	22,200	22,100 ³
Calcined	--	--	--	200	100 ³
Nitrogen, N content of ammonia thousand tons	1,299	1,151	1,208	1,169	1,362 ³
Salt:					
Rock do.	748	923	841	787	839 ³
Recovered from brine do.	2,536	2,488	2,652	2,689	2,719 ³
Total do.	3,284	3,411	3,493	3,476	3,558 ³
Sand and gravel, excluding glass sand:					
Aggregates:					
Mine output	72,082 ^r	84,432 ^r	88,610 ^r	72,380 ^r	66,722 ³
Processed	64,192	71,196	73,588	62,534 ^r	62,799 ³
Foundry sand do.	979	905	1,055	849 ^r	628 ³
Filling sand do.	13,695	11,352	9,298	8,914	9,000
Lime-sand brick production sand thousand cubic meters	728	673	718	492	411 ³

See footnotes at end of table.

TABLE 5--Continued
POLAND: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	1998	1999	2000	2001	2002
INDUSTRIAL MINERALS--Continued					
Silica:					
Quartz and quartz crystal, processed	19,500	23,000	52,200	65,900	75,000 ³
Quartzite, refractory, processed	203,800	171,700	176,700	114,200	80,000 ³
Quartz schist, processed	3,100	--	5,500	5,500	3,000 ³
Glass sand processed thousand tons	1,375	1,418	1,532	1,423	1,600 ³
Glass:					
Construction, flat do.	523	479	427	394	400
Technical do.	65	64	68	54	60
Commercial do.	74	79	79	81	80
Packing do.	918	928	976	993	900
Sodium compounds, n.e.s.:					
Carbonate (soda ash), 98% do.	983	910	1,018	1,062	1,054 ³
Caustic soda (96% NaOH) do.	807	737	394	348	395 ³
Stone:					
Dolomite, mine output do.	5,679	1,861	2,204	1,639	1,585 ³
Limestone, mine output for lime do.	11,950	12,373	13,858	11,324	10,306 ³
Limestone, mine output for non-lime end use do.	28,364	28,914	28,257	24,289	23,233 ³
Crushed and dimension stone, mine output do.	23,113	23,877	24,483	22,466	22,619 ³
Sulfur:					
Byproduct:					
From metallurgy do.	260	278	279	277	275
From petroleum do.	60	74	131	162	150
Total do.	320 ^r	352	410	439	425
Native, Frasch do.	1,345	1,175	1,369	942	760 ³
From gypsum ^e do.	-- ^r	-- ^r	--	10	10
Total sulfur do.	1,665	1,527	1,779	1,381	1,620
MINERAL FUELS AND RELATED MATERIALS					
Carbon black	22,600	18,700	12,500	15,100	15,000
Coal:					
Bituminous do.	115,726	111,894	103,331	103,992	103,546 ³
Lignite and brown do.	62,820	60,839	59,484	59,557	58,210 ³
Total do.	178,546	172,733	162,815	163,549	161,756
Coke, coke oven do.	9,944	8,575	8,972	8,844	8,787 ³
Fuel briquets, all grades do.	64	50	50	50	50
Gas:					
Natural million cubic meters	4,852	4,757	4,956	5,175	5,259 ³
Manufactured:					
Town gas do.	8	7	7	6	6
Coke oven gas do.	4,209	3,579	3,905	3,851	3,800
Generator gas do.	400	400 ^e	400	300	300
Total do.	4,617	3,986	4,112	4,157	4,106
Peat, fuel and agricultural thousand tons	243	310	380	325	316 ³
Petroleum:					
Crude, as reported do.	357	425	653	767	728 ³
Refinery products ⁶ do.	16,191	16,784	18,695	18,680	17,540

^eEstimated. ^rRevised. -- Zero.

¹Table includes data available through December 2003.

²In addition to the commodities listed above, antimony and germanium, associated with polymetallic deposits, and cobalt and nickel, associated with copper ores, are produced in quantities that so far have not warranted further recovery.

³Reported figure.

⁴Estimates based on reported platinum and palladium-bearing final (residual) slimes and their average Platinum and Palladium content from electrolytic copper refining.

⁵Includes building gypsum, as well as an estimate for gypsum used in the production of cement.

⁶Includes virtually all major products.

TABLE 6
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2002¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Aluminum:			
Primary	Huta Aluminium "Konin" S.A.	Konin	55.
Secondary	Zakłady Metalurgiczne "Skawina"	Skawina	20.
	Zakłady Metali Lekkich SA "Kety"	Kety	NA.
	Zakłady Metalurgiczne "Trzebinia"	Trzebinia	NA.
Barite ²	Kopalnia Barytu "Buguszow" Sp. z o.o.	Boguszow, Stanislawow	40.
Cement:			
Do.	Zakłady Cementowo-Wapiennicze "Gorazdze" S.A.	Chorula	1,800 clinker, 2,400 cement.
	Cementownia "Ozarow" S.A.	Ozarow	2,200 clinker, 2,400 cement.
Do.	Cementownia "Chelm" S.A.	Chelm	1,440 clinker, 2,640 cement.
Do.	Kombinat Cementowo-Wapienniczy "Warta" S.A.	Dzialoszyn	600 clinker, 1,150 cement.
	Cementownia "Malogoszcz" S.A.	Malogoszcz	1,840 clinker, 1,800 cement.
Do.	Zakłady Cementowo-Wapiennicze "Nowiny" S.A.	Sitkowka	785 clinker, 1,070 cement.
	Cementownia "Strzelce Opolskie" S.A.	Strzelce Opolskie	1,257 clinker, 1,630 cement.
Do.	Kombinat Cementowo-Wapienniczy "Kujawy" S.A.	Bielawy	900 clinker, 1,000 cement.
	Cementownia "Rudniki" S.A.	Rudniki	840 clinker, 1,470 cement.
Do.	Cementownia "Wierzbica" S.A.	Wierzbica	759 clinker, 1,000 cement.
	Cementownia "Nowa Huta" S.A.	Krakow	290 clinker, 1,100 cement.
Do.	Cementownia "Rejowiec" S.A.	Rejowiec	600 clinker, 845 cement.
	Cementownia "Odra" S.A.	Opole	433 clinker, 800 cement.
Do.	Cementownia "Warszawa"	Warszawa (Warsaw)	600 cement.
	Cementownia "Groszowice" Sp. z o.o.	Opole	304 clinker, 425 cement.
Do.	Cementownia "Polcement-Saturn"	Wojkowice	400 cement.
	Cementownia "Wiek"	Ogrodzieniec	710 clinker, 240 cement.
Do.	Fabrika Cementu "Wysoka"	Lazy	304 clinker, 425 cement.
	Cementownia "Wejhorowie"	Wejhorowo	42 clinker, 45 cement.
Coal:			
Anthracite	Zakład Wydobywco Przetworczy Antracytu Walbrzych-Gaj	Lower Silesia	200.

See footnotes at end of table.

TABLE 6--Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2002¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Coal--Continued:			
Bituminous	Bytomska Spolka Weglowa S.A.	Upper Silesia (9 mines)	140,000.
	Rudzka Spolka Weglowa S.A.	do. (6 mines)	
	Gliwicka Spolka Weglowa S.A.	do. (7 mines)	
	Katowicki Holding Weglowy S.A.	do. (11 mines)	
	Nadwislanska Spolka Weglowa S.A.	do. (8 mines)	
	Rybnicka Spolka Weglowa S.A.	do. (5 mines)	
	Jastrzebska Spolka Weglowa S.A.	do. (6 mines)	
	Seven independent mines	do.	
	Walbrzyskie Kopalnie Wegla Kamiennego	Lower Silesia	
	KWK "Nowa Ruda"	do.	
Lignite	KWK "Bogdanka" S. A.	do.	75,000.
	KWK "Belchatow"	Belchatow	
	KWK "Turow"	Turow	
	KWK "Konin"	Konin	
	KWK "Adamow"	Adamow	
Coke	KWK "Sieniawa"	Sieniawa	12,000.
	Zaklady Koksownicze im. Powstancow Sl.	Upper Silesia	
	Zaklady Koksownicze "Przyjazn"	do.	
	Kombinat Koksochemiczny "Zabrze"	do.	
	Huta im. Sendzimira	do. (Krakow)	
Copper:	Huta "Czestochowa"	do. (Czestochowa)	8,760.
	Zaklady Koksownicze "Walbrzych"	Lower Silesia	
	Ore, gross weight (1.2%-2.2% Cu)	Kombinat Gorniczo Hutniczy Miedzi (KGHM) Polska Miedz S.A. [KGHM, S.A.]	
	Do.	Lubin Mine	
	Do.	do.	
	Do.	Polkowice- Sieroszowice Mine, Lubin-Glogow District	
	Concentrate, gross weight (25.2% - 25.9% Cu)	Rudna Mine, Lubin-Glogow District	
	Do.	Lubin beneficiation plant, Lubin-Glogow District	
	Do.	Polkowice beneficiation plant, Lubin-Glogow District	
	Do.	Rudna beneficiation plant, Lubin-Glogow District	
Metal, refined	do.	Refineries at Glogow I, Glogow II, and Legnica	480.
Feldspar	Strzeblowskie Kopalnie Surowcow Mineralnych	Mine at Sobotka, Lower Silesia; workings at Pagorki Zachodnie	50.
Ferroalloys:			
Electric furnace (FeSiMn, FeMn, FeCr, FeSi)	Huta "Laziska" S.A.	Upper Silesia at Laziska Gome	170.
Blast furnace (FeMn)	Huta "Pokojski" S.A.	Upper Silesia, Ruda Slaska and Pagorki Wschodnie	90.
Gold	kilograms	KGHM "Polska Miedz" S.A.	550.
Gypsum and anhydrite		Refinery at Glogow "Trzebinia"	1,400.
		Zaklady Przemyslu Gipsowego "Dolina Nidy"	
		Zaklad Gipsowy "Stawiany"	
		Kopalnia Anhydrytu "Nowy Lad"	
		KGHM "Polska Miedz" S.A.	Lower Silesia, Iwiny

See footnotes at end of table.

TABLE 6--Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2002¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Helium million cubic meters	Zakład Odazotowania Gazu	Western Poland, Odolanow	3.
Kaolin	KSM "Surmin-Kaolin" S.A.	Lower Silesia, Nowogrodziec	50.
Lead-zinc:			
Concentrate	Zakłady Gorniczo-Hutnicze (ZGH) "Boleslaw"	Mines and concentrators at Olkusz and Pomorzany, Bukowno region	60 Pb, 160 Zn.
	Zakłady Gornicze "Trzebionka" S.A.	Mines and concentrator at Trzebinia	
Metal:			
Pb, refined	Huta Cynku "Miasteczko Slaskie"	Refinery at Miasteczko Slaskie	60.
Do.	Huta Metali Niezelaznych "Szopienice"	Katowice	35.
Zn, refined	Huta Cynku "Miasteczko Slaskie"	Imperial Smelter at Miasteczko Slaskie	60.
Do.	Zakłady Metalurgiczny "Silesia" (input from Huta "Miasteczko Slaskie")	Refinery at Katowice	-30.
Do.	Zakłady Gorniczo-Hutnicze "Boleslaw"	Refinery at Boleslaw	65.
Do.	Huta Metali Niezelaznych "Szopienice"	Katowice	28.
Lime ³	Zakłady Przemyslu Wapienniczego Trzuskawica Slaskie Zakłady Przemyslu Wapienniczego Opolwap S.A. Zakłady Przemyslu Wapienniczego Bukowa Kombinat Cementowo-Wapienniczy Kujawy S.A. Zakłady Cementowo-Wapiennicze Gorazdze S.A. Zakłady Cementowo-Wapiennicze Nowiny Produkcyjno-Handlowo-Uslugowe Wapmo-Sabinow Wojcieszowskie Zakłady Przemyslu Wapienniczego Sp. z o.o. Zakłady Przemyslu Wapienniczego w Sulejowie Zakład Wapienniczy w Plazie	Kieleckie County, Swietokrzyskie Mountains Opole County Kieleckie County, Swietokrzyskie Mountains Bydgoskie County Opole County Kieleckie County Czestochowa County Jeleniogorskie County Piotrkowskie County Katowickie County	4,500.
Natural gas million cubic meters	Ministry of Mining and Energy	Gasfields at pre-Carpathian foothills, Carpathian Mountains Lowlands, near Ostrow, Wielkopolski Poznan, and Trzebnica, north of Wroclaw	4,900.
Nitrogen:			2,400.
Ammonia	Zakłady Azotowe "Pulawy" S.A. Zakłady Azotowe "Kedzierzyn" S.A. Zakłady Azotowe "Wloclawek" S.A. Zakłady Azotowe S.A. w Tarnowie Zakłady Azotowe S.A. w Chorzowie Zakłady Chemiczne "Police"	Pulawy in eastern Poland Kedzierzyn in Upper Silesia Wloclawek in central Poland Tarnow in southern Poland Chorzow in Upper Silesia Police in northwest Poland	
Fertilizer (N)	do.	do.	1,700.
Petroleum:			
Crude	Polskie Gornictwo Naftowe i Gazownictwo Warszawa	Oilfields in northern and northwestern; lowlands; sub-Carpathian region and Carpathian Mountains	200.
Do.	Predsiębiorstwo Poszukiwan i Eksploatacji Rpy i Gazu "Petrobaltic"	Baltic Sea Shelf	100.

See footnotes at end of table.

TABLE 6--Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2002¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Petroleum--Continued:			
Refined	Petrochimia-Plock Rafineria "Gdansk" Rafineria "Czechowice" Rafineria "Trzebinia" Rafineria "Glimar" Gorilice Rafineria "Jedlicze" Podkarpackie Zakłady Rafineryjne w Jasle	Plock in central Poland Gdansk in northern Poland Czechowice in southern Poland Trzebinia in southern Poland Gorilice in southern Poland Jedlicze in southern Poland Jaslo in southern Poland	13,500.
Salt, all types	Inowroclawskie Kopalnie Soli S.A. Kopalnia Soli "Klodawa" Kopalnia Soli "Wieliczka" Kopalnia Soli "Bochnia" KGHM "Polska Miedz" S.A. Kopalnia Wegla Kamiennego "Debiensko" Janikowskie Zakłady Sodowe "Janikosoda" S.A.	Gora, Mogilno I, and Mogilno II mines at Inowroclaw in central Poland Klodawa in central Poland Wieliczka in southern Poland, near Krakow, mining deposits at Barycz and Wieliczka Southern Poland, mines at the Lezkowice and Siedlec-Moszczenica-Lapczyca deposit. Not known to have operated in 1999. Sierszowice in southwestern Poland Debiensko, Upper Silesia Janikowo in central Poland	6,500.
Selenium	Huta Metali Niezależnych 'Szopienice" KGHM "Polska Miedz" S.A.	Katowice Refinery at Glogow	80.
Silver	KGHM "Polska Miedz" S.A. Zakłady Metalurgiczne Trzebinia	Refined from dore produced by the Szopienice Pn-Zn smelter-refinery largely from KGHM-supplied slimes	1.
Steel:			
Crude and semimanufactures	Huta Katowice S.A. Huta im. T. Sendzimir S.A. P.P. Huta "Zawierciu" Huta Czestochowa S.A. Huta "Ostrowiec" S.A. P.P. Huta "Labedy" Huta "Lucchini-Warszawa" Sp. z o.o. Huta Florian S.A. Huta "Stalowa Wola" S.A. Huta "Jednosc" S.A.	Plant at Dobrowa Gornicza, producing pig iron, crude steel, hot-rolled products, and cast steel Steelworks at Krakow, producing pig iron, crude steel, hot-rolled products, cold-rolled products, pipes, and cast iron Steelworks at Zawierciu, producing crude steel, hot-rolled products, cast iron, and cast steel Steelworks at Czestochowa, producing pig iron, crude steel, hot-rolled sheets, pipes, and cast iron Steelworks at Ostrowiec-Swietokrzyski, producing crude steel, hot-rolled products Steelworks at Gliwice, producing crude steel, and hot-rolled products Steelworks in Warsaw, producing crude steel, hot-rolled products, and cold-rolled strip Steelworks in Swietochlowicach, producing crude steel, hot-rolled products, galvanized sheet, and cold-rolled strip Steelworks at Stalowa Wola, producing crude steel, hot- and cold-rolled products Steelworks at Siemianowice Slaskie, producing crude steel, hot-rolled products and pipes	14,000 (crude).

See footnotes at end of table.

TABLE 6--Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2002¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Steel--Continued:			
Crude and semimanufactures--Continued:	Huta "Batory" S.A.	Steelworks at Chorzow, producing crude steel, hot-rolled products, and pipes	
	P.P.Huta "Baildon"	Steelworks in Katowice, producing crude steel, hot-rolled products, cold-rolled strip, and cast steel	
	Huta "Malapanew" S.A.	Steelworks at Ozimek, producing crude steel and cast steel	
	Huta "Zabrze" S.A.	Steelworks at Zabrze, producing crude steel, cast iron, and cast steel	
	Huta "Zygmunt" S.A.	Steelworks at Bytom, producing crude steel, cast iron, and crude steel	
Semimanufactures only	Huta Cedler S.A.	Steelworks in Sosnowiec, producing hot-rolled products, cold-rolled strip, and cast iron	
	P.P. Huta "Kosciuszko"	Steelworks at Chorzow, producing hot-rolled products	
	Huta "Pokoj" S.A.	Steelworks at Ruda Slaska, producing hot-rolled products	5,700.
	Huta "Andrzej" S.A.	Steelworks at Zawadskie, producing pipes	
	Huta "Ferrum" S.A.	Steelworks in Katowice, producing pipes	
	P.P. Huta "Bobrek"	Steelworks in Bytom, producing pig iron, hot-rolled products, and cast iron	
	Huta "Buczek" S.A.	Steelworks in Sosnowiec, producing pipes and cast iron	
	P.P. Huta "1 Maja"	Steelworks in Gliwice, producing hot-rolled products	
	Zaklad Wielkopiecowy "Szczecin" Sp. z o.o.	Steelworks at Szczecin, producing pig iron	
Sulfur	P.P.Kopalne i Zaklady Przetworcze Siarki "Siarkopol"	Operations at Tarnobrzeg, mining the Jeziorko-Grebow-Wydza deposit	
	P.P. Kopalnie i Zaklady Chemiczne Siarki "Siarkopol"	Operations at Grzybow, mining the Osiek and Grzybow-Gacki deposits	

NA Not Available.

¹The data presented in this table was compiled, in large measure, from information provided in the Minerals Yearbook of Poland (Bilans Gospodarki Surowcami Mineralnymi w Polsce Na Tle Gospodarki Swiatowej 1995) prepared and published by the Department of Mineral and Energy Policy, Mineral and Energy Economy Research Centre of the Academy of Science of Poland, The Ministry of Environmental Protection, Natural Resources, and Forestry. Additionally, very valuable information and criticism was provided by Mr. Krystof Galos and other members of the Department of Mineral Policy.

²The production of barite at the "Boguszow " Barite Mine was stopped in 1997 because of large-scale area flooding and its future status is uncertain.

³In order of size.

TABLE 7
POLAND: RESOURCES OF MAJOR MINERALS IN 2002

Commodity	Number of deposits		Geologically documented resources ¹		
	Total	Exploited	Total	Exploited	2002/2001 (%)
METALS					
Copper	14	5	2,369.0	1,451.0	-5.1
Lead and zinc	21	3	180.0	41.0	--
INDUSTRIAL MINERALS					
Raw materials for chemicals:					
Sulfur, native	17	4	471.0	41.0	-4.7
Rock salt	20	4	80,251.0	8,327.0	-1.6
Barite	5	--	5.7	--	--
Potassium-magnesium salts	5	1	669.0	72.0	--
Raw materials for construction:					
Chalk	186	64	195.0	36.0	-23.4
Clay:					
Argillaceous material for construction ceramics	1,205	390	3,993.0	628.0	-4.0
Bentonite	8	1	2.7	0.5	--
Ceramic clays	28	7	141.0	11.0	--
Refractory clays	18	4	56.0	6.0	-25.0
Kaolin	14	2	215.9	83.5	n/a
Dolomites	11	4	352.0	163.0	-1.2
Feldspar ore	7	2	86.9	12.3	--
Gypsum and anhydrite	15	4	265.0	120.0	-0.7
Magnesite	6	1	13.3	3.1	-53.0
Sand and gravel:					
Filling sand	33	10	4,693.0	1,196.0	1.0
Moulding sand	77	11	352.0	118.0	-0.8
Quartz sand for brick and concrete	158	51	727.0	149.0	2.6
Gravel aggregates	4,655	1,676	14,454.0	3,185.0	+1.7
Silica:					
Glass sand	30	7	605.0	138.0	-1.4
Quartz, veined	7	3	6.7	5.5	--
Quartzite, refractory	19	1	15.8	8.9	--
Stone:					
Stone for construction and road use	534	216	8,065.0	3,860.0	-1.0
Limestone and marl for lime and cement use	176	38	17,384.0	6,197.0	-0.4
MINERAL FUELS					
Coal:					
Bituminous	128	46	44,084.0	15,888.0	-1.0
Lignite	76	10	13,861.0	2,014.0	-3
Gas: ²					
Natural	245	183	149.0	128.0	+8.5
Coal methane	43	18	80.0	12.0	--
Petroleum	85	73	13.0	12.0	--

¹Million metric tons, unless otherwise specified.

²Billion cubic meters.

Sources: Central Statistical Office of Poland, 2003, Statistical Yearbook of Industry. Polish Academy of Sciences, 2003, Minerals Yearbook of Poland.

TABLE 8
POLAND: IMPORTS OF SELECTED MINERAL COMMODITIES

(Thousand metric tons unless otherwise specified)

Commodity	2000	2001	2002
METALS			
Aluminum and articles thereof	303	310	374
Chromite	29	26	9
Iron ore and concentrate	9,737	7,709	6,957
Lead:			
Concentrates, Pb content	--	4	5
Refined lead	14	12	21
Manganese	39	44	15
Steel:			
Flat-rolled, nonalloy semimanufactures	1,897	2,535	2,357
Stainless and articles thereof	79	84	91
Pipes, and hollow profiles	259	289	344
INDUSTRIAL MINERALS			
Alumina	151	135	123
Barite	7	7	6
Bauxite	27	38	50
Bentonite	62	65	68
Cement (clinker)	606	251	67
Feldspar	82	144	168
Flourspar	5	5	6
Glass	429	466	549
Graphite	39	52	58
Gypsum and Ahydrite	78	23	46
Kaolin, washed	90	101	114
Mineral fertilizers	1,288	1,426	1,609
MINERAL FUELS AND RELATED MATERIALS			
Coal, including briquettes	1,503	1,903	2,768
Natural gas	million cubic meters	7,676	8,325
Petroleum	18,002	17,513	17,872
Refined petroleum	1,797	2,318	2,501

-- Zero.

Sources: Central Statistical Office of Poland, Yearbook of Foreign Trade, 2002 and 2003. Polish Academy of Sciences, Minerals Yearbook of Poland, 1998-2002.

TABLE 9
POLAND: EXPORTS OF SELECTED MINERAL COMMODITIES

(Thousand metric tons, unless otherwise specified)

Commodity	2000	2001	2002
METALS			
Aluminum and articles thereof	216	230	264
Cadmium, metric tons	--	198	49
Cobalt, metric tons	41	48	38
Copper:			
Refined copper and copper alloys	284	233	288
Copper manufactures	149	143	123
Lead:			
Concentrates, Pb content	45	56	58
Metal, refined	9	10	21
Silver and articles thereof, metric tons	1,042	1,094	1,135
Steel:			
Pig iron	138	41	3
Steel, crude	--	2	3
Flat-rolled, nonalloy semimanufactures	2,185	2,219	2,151
Pipes and hollow profiles	178	202	35
Zinc:			
Concentrate, Zn content	12	16	34
Metal and articles thereof	87	92	89
INDUSTRIAL MINERALS			
Cement	978	897	478
Glass	598	682	662
Salt	427	376	343
Sulfur	1,024	774	600
MINERAL FUELS AND RELATED MATERIALS			
Coal:			
Anthracite and bituminous	23,247	23,032	22,626
Lignite	9	15	41
Coke and semicoke	3,690	3,924	4,226
Refined petroleum	2,154	2,523	2,446
-- Zero.			

Sources: Central Statistical Office of Poland, Yearbook of Foreign Trade, 2001, 2002. Polish Academy of Sciences, Minerals Yearbook of Poland, 1996-2001.

TABLE 10
SLOVAKIA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity		1998	1999	2000	2001	2002
METALS						
Aluminum:						
Alumina ^c		100,000	100,000	109,813	110,078	16,494 ³
Aluminum ingot, primary		135,000	127,000	136,753	133,672	146,958 ³
Copper:						
Mine output:						
Ore, Cu content		155	--	--	--	--
Concentrate, Cu content		160	--	11	6	2
Metal, refined, primary and secondary ^c		21,626	1,432	1,500 ^c	1,500	1,500
Gallium metal ^c	kilograms	600	500	500	500	500
Gold metal	do.	340	363	306	157	77 ³
Iron and steel:						
Iron ore:						
Gross weight, av. 34% Fe	thousand tons	899	891	909	888 ^r	611 ³
Concentrate, gross weight	do.	479	465	477	435	326 ³
Fe content		262	255	255	238	175 ³
Metal:						
Pig iron	do.	2,756	2,987	3,166	3,255	3,533 ³
Ferroalloys, total electric furnace, ⁴	do.	95,000 ^c	95,000 ^c	95,000	95,000	95,000
of which:						
Ferrochromium		11,785	6,986	17,702	5,968	5,695
Ferrosilicon ^c		49,963	70,000	50,000	50,000	50,000
Steel, crude	thousand tons	3,178	3,569	3,733	3,989	4,275
Semimanufactures ^c	do.	3,500	3,500	3,500	3,500	3,500
Lead, in concentrate		41	38	38	31	6 ³
Zinc, in concentrate		54	51	50	28	9 ³
INDUSTRIAL MINERALS						
Barite concentrate		14,880	15,900	13,700	14,450 ^r	25,820 ³
Cement, hydraulic	thousand tons	2,875	4,718	3,045	3,123	3,141 ³
Clays:						
Bentonite		81,010	64,390	66,528	82,915	66,128 ³
Kaolin		14,580	22,930	32,000	34,700 ^r	24,600 ³
Refractory		12,000	3,000	2,000	3,000	3,000
Diamond, synthetic ^c	carats	5,000	5,000	5,000	--	--
Dolomite	thousand tons	1,796	1,505	1,176	1,471	1,357 ³
Gypsum and anhydrite, crude		128,000	117,000	124,000	169,000	121,700 ³
Lime, hydrated and quicklime	thousand tons	744	759	754	816	911 ³
Magnesite, concentrate		877,840	918,000	1,000,000	961,000 ^r	930,000 ³
Nitrogen, N content of ammonia ^c		250,000	250,000	215,000	209,000	326,000 ³
Perlite		24,240	19,460	17,020	14,910 ^r	18,630 ³
Salt		100,470	119,000	121,700	123,000	97,400 ³
Sand and gravel	thousand cubic meters	1,906	1,469	1,271	1,300	1,300
Stone:						
Limestone and other calcareous stones for cement	thousand tons	7,200	7,000	6,700	3,596 ^r	3,694 ³
Crushed stone	thousand cubic meters	4,318	2,844	2,868	4,602 ^r	4,715 ³
Talc		2,820	1,900	1,800	2,600	2,290 ³
Zeolite		10,000	14,000	15,000	15,000	15,000

See footnotes at end of table

TABLE 10--Continued
SLOVAKIA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity		1998	1999	2000	2001	2002
MINERAL FUELS AND RELATED MATERIALS						
Coal, brown and lignite	thousand tons	3,966	3,745	3,589	3,424	3,406 ³
Coke:						
Metallurgical	do.	1,730	1,515	1,500	1,500	1,500
Unspecified ^e	do.	200	200	200	200	200
Natural gas	million cubic meters	311	235	202	212	212 ³
Petroleum:						
Crude:						
As reported	thousand tons	61	59	60	54	52 ³
Converted	thousand 42-gallon barrels	400 ^e	400 ^e	400	400	400
Refinery products ^e	do.	40,000	40,000	40,000	40,000	40,000

^eEstimated. ^rRevised. -- Zero.

¹Table includes data available through December 2003. In addition to the commodities listed, arsenic, diatomite, feldspar, illite, sodium compounds, sulfur, sulfuric acid, and talc are produced, but information is inadequate to make reliable estimates of output.

²Estimated data are rounded to no more than three significant digits.

³Reported figure.

⁴May include some FeCrSi and FeNi, if any was produced.

TABLE 11
SLOVAKIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(Thousand of metric tons unless otherwise specified)

Commodity	Major operating companies ¹	Location of main facilities ²	Annual capacity
Aluminum	ZSNP Aluminum Works (Slovalco)	Ziar and Hronom, central Slovakia	108
Cement	Lietavska Lucka, Stupava, and Turna	Slovakia	5,400
Coal:			
Brown	Hornonitranske Bane, a.s.	Prievidza, central Slovakia	3,500
Do.	Bana Dolina, a.s.	V'lký Krtis, southern Slovakia	500
Lignite	Bana Zhorie, a.s.	Holic, Western Slovakia	400
Copper:			
Ore	Slovinky, Hodrusa-Hamre, and Rudnany	Central Slovakia	500
Refinery	Krompachy	do.	27
Gallium kilograms	ZSNP Aluminum Works	Ziar and Hronom, central Slovakia	4,000
Iron:			
Ore	Nizana Slana and Rudnany	Central Slovakia	1,600
Concentrate	do.	do.	1,300
Lead and zinc, ore	Banska Stiavnica	do.	200
Magnesite	SMZ a.s. Jelsava	Eastern Slovakia	350
Do.	Slovmag a.s., Lubenik	Central Slovakia	150
Petroleum, refinery	Bratislava, Dubova	Slovakia	NA
Salt	Solivarý a.s., Presov	Eastern Slovakia	150
Steel, crude	VSZ HOLDING, a.s., formerly Vychodoslvenske Zeleziarne sp	Eastern Slovakia, Kosice	4,000
Do.	Zeleziarne Podbrezova a.s.	Slovakia, Podbrezova	600

NA Not available.

¹All mining companies are Government owned.

²Names and locations of mines and crude oil refineries are identical.